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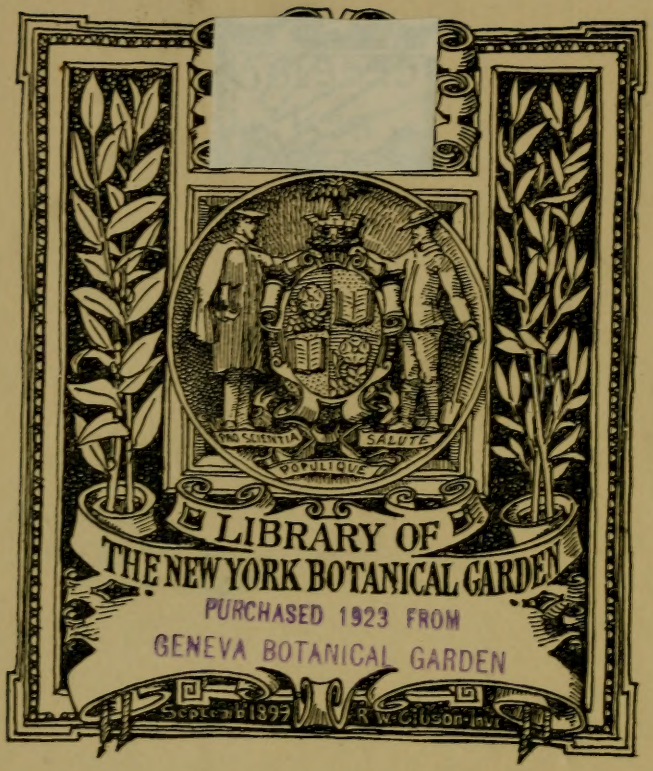
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MATERIALS

FOR A

FLORA

OF THE MALAYAN PENINSULA

BY

GEORGE KING, K.C.I.E., LL.D., F.R.S.,

LATE SUPERINTENDENT OF THE ROYAL BOTANIC GARDEN, CALCUTTA.

DISCIFLORÆ.

(No. 6 to 8 of the series).

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PREFACE.

The papers contained in this volume originally appeared in the *Journal of the Asiatic Society of Bengal.* For the convenience of botanists interested in the *Flora* of the region of which they treat, I had some spare copies of each printed off as it appeared, and these are now issued as a volume. The volume containing my description of the Thalamifloral orders was issued some years ago. The present volume covers the *Disciflorœ* (in the sense of the *Genera Plantarum* of Messrs. Bentham and Hooker); and, in the course of a year or so, I hope to issue a similar account of the *Calyciflorœ.* It will be observed that each page bears two numbers. The one at the top of the page is that of the volume of the *Journal* in which the paper originally appeared, but it is not referred to in the index; it may be used, however, by anyone quoting these papers. The numbers at the bottom of the pages, which run continuously, are those used in the index. The dates of the original publication of the three papers contained in the present volume are as follows :—

No. 6.	Orders XX. to XXVI., . . .	August, 1893.
„ 7.	„ XXVII. to XXX., . .	April, 1895.
„ 8.	„ XXXI. to XXXVI., . .	July, 1896.

It may be useful here to mention that in the following pages the length given for a leaf is that of the blade only, the measurement of the petiole (if any) being given separately; and that the breadth given for a leaf is that of its broadest part.

From the Journal, Asiatic Society of Bengal, Vol. LXII, Part 2, No. 4, 1893.

Materials for a Flora of the Malayan Peninsula—*By* GEORGE KING, M. B., LL. D., F.R.S., C.I.E., *Superintendent of the Royal Botanic Garden, Calcutta.*

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No. 6.

ORDER XX. LINEÆ.

Herbs or shrubs. *Leaves* usually alternate, simple, entire, rarely crenate-serrate; stipules lateral or intrapetiolar or 0. *Inflorescence* various. *Flowers* regular, bisexual. *Sepals* 5, rarely 4, free or connate below, imbricate. *Petals* as many, hypogynous or slightly perigynous, usually fugacious, often contorted. *Stamens* 4–5, with as many interposed staminodes, or 8–10, (rarely more) filaments united at the base into a hypogynous or slightly perigynous ring, filiform; anthers versatile, 2-celled. *Glands* 5, entire or 2-lobed, usually adnate to the staminal ring, or obsolete. *Ovary* entire, 3–5 celled; styles 3–5, free or more or less connate, stigmas terminal; ovules 1 or 2, inserted in the inner angle of the cells, anatropous, pendulous. *Fruit* usually splitting into 3–5 cocci, rarely a drupe. *Seeds* 1–2 in each cell, testa sometimes winged, albumen fleshy or 0; embryo nearly as long as the seed, straight, rarely incurved, cotyledons broad, radicle superior.—DISTRIB. All regions; genera 14, species about 145.

Petals contorted, fugaceous; perfect stamens 2 or 3 times as many as the petals. Fruit drupaceous. Scandent herbs with hooked lateral branchlets	1 *Roucheria.*
Petals imbricate, with scales on their inner faces, ultimately deciduous; perfect stamens twice as many as the petals. Fruit drupaceous. Shrubs or trees	2 *Erythroxylon.*
Petals contorted, persistent; stamens 2 to 4 times as many as the petals. Fruit capsular, septicidal	3 *Ixonanthes.*

AUG 7 - 1923

1. ROUCHERIA, Planch.

Erect or climbing trees or shrubs with revolute woody tendrils. *Leaves* quite entire or glandular-serrate, coriaceous, penninerved; stipules minute, caducous. *Flowers* axillary, yellow, subsessile, or in excessively short fascicled spikes; pedicels bracteolate. *Sepals* 5. *Petals* 5, hypogynous, contorted, fugacious. *Stamens* 10, all fertile, filaments connate into a short tube below. *Glands* obsolete. *Ovary* 3–5-celled,

styles 3–5, filiform, stigmas cuneate, 2-lobed; ovules 2, collateral. *Drupe* scarcely fleshy, subglobose; stone 3–6-angled, bony, cells 1-2-seeded. *Seeds* compressed, pendulous; albumen rather fleshy, embryo with foliaceous cotyledons and an elongate radicle.—Distrib. 3 or 4 species, one or more Malayan and 2 from Guiana.

1. Roucheria Griffithiana, Planch. in Hook. Journ. Bot. VI, 143: VII, 527. A glabrous climbing shrub with hooked lateral branchlets. *Leaves* alternate, lanceolate, oblanceolate or elliptic-lanceolate, rather bluntly caudate-acuminate, obscurely crenate-serrate, the base cuneate; main nerves faint, 6 to 8 pairs, curving; length 3 to 5 in., breadth 1·2 to 1·6 in.; petiole ·35 to ·5 in., slender. *Flowers* ·35 in. in diam., in dense shortly-pedicelled clusters of 7 or 8. *Petals* narrowly oblong, obtuse, very fugaceous, thin. *Drupe* ovoid, ·25 in. long, the pulp thin. Hook. fil. Fl. Br. Ind. I, 414.

In all the provinces except the Andamans and Nicobars. Distrib. Sumatra, Borneo.

2. Erythroxylon, Linn.

Shrubs or small trees, usually quite glabrous. *Leaves* alternate, entire, often subdistichous; stipules intrapetiolar, often imbricating on short arrested leafless branches. *Flowers* axillary, small, white or pink, solitary or fascicled, peduncles bracteolate. *Sepals* 5, rarely 6, free or connate. *Petals* 5, hypogynous, deciduous, with an erect double ligula on the inner face, imbricate. *Stamens* 10, rarely 12, filaments united into a glandular or eglandular tube. *Ovary* 3- rarely 4-celled; styles 3, rarely 4, free or connate, stigmas capitate; ovules, 1, rarely 2 in each cell. *Drupe* 1-celled, 1-seeded. *Seed* with a thin testa, albumen variable in quantity or 0; embryo straight, cotyledons plano-convex, radicle short.—Distrib. Species about 50, mostly American, and tropical.

1. Erythroxylon burmanicum Griff. Notul. IV, 468: Ic. Pl. Asiat. t. 581, f. 3. A glabrous tree 20 to 30 feet high. *Leaves* elliptic or obovate-elliptic, obtuse or slightly emarginate, the base cuneate; upper surface shining, the lower glaucous, both with open reticulations; the main nerves about 8 pairs, not more prominent than the secondary; length 1·75 to 2·5 in., breadth ·75 to 1·25 in., petiole ·2 to ·3 in. *Flowers* in clusters of 2 to 4, their pedicels about ·25 in. long. *Fruit* cylindric-clavate, shining, ·5 in. long; the calyx and staminal tube sub-persistent. Hook. fil. Fl. Br. Ind. I, 415; Kurz For. Fl. Burma I, 171. *E. sumatranum*, Miq. Fl. Ind. Bat. Suppl. 572. *E. retusum*, Bauer ex Teysm. and Binn. in Tijdisch Nat. Ver. Ned. Ind. XXVIII, 71. *Ficus cuneata*, Wall. Cat. 4534.

In all the provinces. Distrib. Burma, Sumatra.

3. Ixonanthes, Jack.

Glabrous trees, often turning black in drying. *Leaves* alternate, entire or crenate-serrate, reticulate; stipules minute or 0. *Flowers* small, in axillary cymose dichotomous peduncled panicles. *Sepals* 5–6, shortly connate at the base. *Petals* 5–6, perigynous, contorted, persistent, hardened round the fruit. *Stamens* 10–20, inserted on the outside of a perigynous annular or cupular eglandular disk. *Ovary* free, 5-celled, cells perfectly or imperfectly 2-locellate; style simple, stigma capitate, lobed; ovules 10. *Capsule* coriaceous or woody, oblong or conic, more or less perfectly 10-celled, septicidal, carpels opening inward. *Seeds* winged or crowned with a mitriform aril, albumen fleshy; embryo lateral, cotyledons foliaceous, radicle superior.—Distrib. Species 3–4, chiefly Malayan.

Leaves oblong-oblanceolate to obovate-oblong, petals ·2 in. long. Capsules ·7 in. long, imperfectly 10-celled	1 *I. icosandra.*
Leaves elliptic to elliptic-rotund, not obovate; petals ·3 in. long. Capsules 1·35 to 1·75 in. long, almost completely 10-celled ...	2 *I. reticulata.*

1. Ixonanthes icosandra, Jack Mal. Miscel. II, No. 7 p. 53: Hook. Comp. Bot. Mag. I, 154. A tree 30 to 40 feet high. *Leaves* coriaceous, oblong-oblanceolate to obovate-oblong, the apex blunt or much rounded; the edges entire, obscurely serrate or crenate, the base cuneate: main nerves spreading, sub-horizontal, faint, about 10 to 12 pairs: length 2·5 to 5·5 in., breadth 1 to 2·5 in., petiole ·25 to ·5 in. *Cymes* on slender peduncles, many-flowered. *Flowers* ovoid, ·2 in. long, scarcely opening; petals broadly elliptic: stamens 12 (usually), the filaments much longer than the petals. *Capsule* narrowly ovoid, ·7 to ·8 in. long, 5-valved, imperfectly 10-celled. *Seeds* 10, on elongated podosperms. Hook. fil. Fl. Br. Ind. I, 416; Miq. Fl. Ind. Bat. i., pt. 2, 494. *I. dodecandra*, Griff. Plant. Cantor 12. *I. cuneata*, Miq. Fl. Ind. Bat. Suppl. 484 and Hook. fil. Fl. Br. Ind. I, 416. *I. obovata* Hook. fil. Fl. Br. Ind. I, 417. *Gordonia? peduncularis*, Wall. Cat. 4409. *Hypericinea dentata*, Wall. Cat. 4832. *Pierotia lucida*, Blume Mus. Bot. i. 180. *Brewstera crenata*, Roem. Synops. i. 141. *Macharisia icosandra*, Planch. MSS. *Ixonanthes sp.* Griff. Notul. iv. 498; Ic. Pl. Asiat., t. 589, f. 2.

In all the provinces except the Nicobars and Andamans; very common.

This is rather a variable plant as to leaves, and to two of the forms specific names have been given. I cannot, however, discover any tangible differences in the flowers or fruit, so I have treated all the forms

as belonging to Jack's *I. icosandra*. The fruit is only imperfectly 10-celled in this species, the vertical processes from the back walls of the cells of the capsule being incomplete. In the next species they are nearly quite complete, and its capsules are really 10-celled.

2. Ixonanthes reticulata, Jack in Mal. Miscel. II, No. 7, 51; Hook. Comp. Bot. Mag. I. 154. A small tree, occasionally only a shrub. *Leaves* coriaceous, not black when dry, elliptic, sometimes elliptic-rotund, the apex blunt, the base cuneate; main nerves 7 or 8 pairs, slightly prominent when dry, interarching ·25 in. from the edge; length 3·5 to 5 in., breadth 2 to 2·75 in., petiole ·6 to ·8 in. *Cymes* on stout peduncles, few-flowered. *Flowers* ovoid to ovoid-rotund, scarcely opening, ·3 in. long, petals broadly elliptic; stamens about 10, the filaments much longer than the petals. *Capsule* 1·35 to 1·75 in, long, 5-valved, 10-celled. Hook. fil. Fl. Br. Ind. I, 417; Griffith Plant. Cantor, 11. *Hypericinea macrocarpa*, Wall. Cat. 4833. *Gordonia decandra*, Roxb. Fl. Ind. ii., 573; Wall. Cat. 4408.

In all the provinces except the Nicobar and Andaman Islands. Distrib. Sumatra.

In this species the 5 cells of the fruit are converted into 10 by a dissepiment springing from the wall of each valve. I have never seen the seeds, all the capsules I have met with being empty.

Order XXI. MALPIGHIACEÆ.

Trees or shrubs, often climbing. *Leaves* (in the Indian genera) opposite, quite entire; stipules small or 0. *Inflorescence* axillary or terminal; pedicels articulate, usually 2-bracteolate. *Flowers* middling-sized or small, white or yellow, more rarely red, yellow, or blue, hermaphrodite, regular or irregular. *Calyx* usually 5-partite; segments imbricate or valvate, 1 or more (never all) furnished with a large gland, rarely eglandular (*Aspidopterys*). *Petals* 5, clawed or not, often fimbriate, imbricate. *Disc* obscure. *Stamens* 10, hypogynous or subperigynous, equal, or 1 or more much larger than the others, filaments free or connate below, anthers 2-lobed. *Ovary* 3-celled; styles 1–3, rarely 4, straight or circinate, stigmas capitate or punctiform or lateral; ovules solitary in each cell, micropyle superior, raphe ventral. *Fruit* (in all the Asiatic genera except *Brachylophon*) of one or more winged samaras. *Seed* exalbuminous; embryo straight or curved, radicle superior.—Distrib. An order, largely represented in America, but scantily in Asia; genera about 50, species about 620.

Styles 1 rarely 2; calyx glandular.

Fruit of 3, united, many-winged samaras ... 1. *Tristellateia.*

Fruit usually of a single 3-winged samara ... 2. *Hiptage.*

Styles 3 rarely 4; calyx eglandular.
Samaras with large membranous reticulate wings ... ... 3. *Aspidopterys.*
Fruit of 2 or 3 turgid almost wingless cocci 4. *Brachylophon.*

1. Tristellateia, Thouars.

Woody climbers. *Leaves* opposite or whorled; petiole 1–2-glandular at the apex; stipules minute. *Flowers* yellow, in terminal or lateral racemes. *Calyx* 5-partite, eglandular, or with minute glands. *Petals* 5, clawed. *Stamens* 10, all perfect; filaments rigid, truncate and articulate at the top, anthers acute. *Ovary* 3-lobed; styles 1–2, slender, one or more reduced to small papillæ. *Ripe carpels* 3, each with about 3 or more wings, the whole forming a stellate fruit. *Seed* obovoid, testa membranous; cotyledons fleshy, hooked.—Distrib. About 8 species, natives of tropical Africa, Asia, and Australasia.

1. Tristellateia australasica, A. Rich. Sert. Astrol. 38 t. 15. Glabrous; *leaves* elliptic, ovate, or oblong, acute, the base cuneate or rounded; main nerves 4 or 5 pairs, forming wide arches far from the margin, faint; length 1·75 to 3·5 in., breadth ·75 to 1·25 in., petiole ·25 to ·35 in., eglandular or with only one gland. *Racemes* 2 to 6 in. long, few-flowered, terminal. *Flowers* 1 in. in diam., their pedicels opposite, minutely 2-bracteolate towards the base. *Petals* ovate. *Fruit* ·5 in. in diam., its wing linear-oblong, coriacious, recurved or spreading. Hook. fil. Fl. Br. Ind. I, 418; Benth. Flor. Austral. I. 286. *Platynema laurifolium*, W. & A. in Edin. New Phil. Journ. 1833, 179; Prodr. 107.

Singapore; Wight, Kurz, Anderson. Pangkore, Scortechini. Pahang, Ridley. Distrib.—Malayan Archipelago, Australasia.

2. Hiptage, Gærtner.

Climbing or suberect shrubs. *Leaves* opposite, quite entire, coriaceous, eglandular, or with a row of remote intramarginal glands beneath; stipules 0. *Racemes* terminal or axillary, simple or compound; peduncles erect, bracteate, jointed to the 2-bracteolate pedicels. *Calyx* 5-partite; glands adnate to the pedicel, large. *Petals* 5, clawed, unequal, white, the odd one discoloured. *Stamens* 10, all fertile, declinate, one much larger than the others; filaments connate at the base. *Ovary* with 3 appendiculate lobes; styles 1 or 2 bearing stigmas, the others rudimentary, all circinate. *Fruit* winged. *Seed* sub-globose, the cotyledons unequal, thick. Distrib: four tropical Asiatic species.

Main nerves of leaves about 4 pairs, inflorescence tomentose or sericeous, flowers ·35 to ·5 in. in diam ... ... 1. *H. sericea.*

Main nerves of leaves 4 to 6 pairs, inflorescence adpressed-pubescent; flowers ·75 to 1 in., in diam. ... ... 2. *H. madablota.*

1. HIPTAGE SERICEA, Hook. fil. Fl. Br. Ind. I, 419. A woody climber, the branches and inflorescence more or less covered with soft brown, villous pubescence; lateral branchlets slender, short. *Leaves* elliptic-ovate or oblong, acuminate, glabrous; main nerves about 4 pairs, ascending; length 2 to 6 in., breadth ·9 to 3 in., petiole ·25 in. *Racemes* 2 to 3·5 in. long, axillary and terminal, sometimes much crowded, minutely tomentose or sericeous, many-flowered. *Flowers* ·35 to ·5 in. in diam., pedicels thickened at the apex, ·25 to ·5 in. long. *Petals* clawed, the odd one much lobed, all more or less villous especially externally; central wing of carpel oblanceolate obtuse, with a central ridge near its base, 1·5 to 2 in. long, the lateral much smaller. *H. parviflora*, Wight Cat. 358. *Clerodendron sericeum*, Wall. Cat. 1814.

Penang: Wallich, King's collector, No. 1454. Singapore, Ridley. Pahang, Ridley No 2386. Malacca, Griffith, Derry. Maingay, (Kew Distrib.) No. 272. Perak, King's collector No. 4097.—DISTRIB. Burmah. Gallatly, No. 890.

This is a very variable plant as to leaves, some of the forms having narrowly oblong, while others have broadly elliptic leaves; the nervation is, however, alike in all. As regards vestiture there is also variation, the inflorescence being in some villous, in others minutely tomentose or pubescent. This must come very near, if it be not actually identical with, *H. javanica*, Blume. The Burmese form of this species has not only narrowly oblong leaves, but racemes 6 inches long and more slender than in Malayan specimens. I propose to name it VAR. *longe-racemosa.*

2. HIPTAGE MADABLOTA, Gærtn. Fruct. II, 169, t. 116. A glabrous woody climber, the young parts and inflorescence hoary or adpressed-tomentose, the branches stout. *Leaves* coriaceous, ovate-lanceolate, oblong or ovate-oblong, acute or shortly acuminate, the base rounded or cuneate, both surfaces glabrous: main nerves 4 to 6 pairs, oblique, slightly prominent beneath; length 4·5 to 6 in., breadth 1·5 to 3 in., petiole ·25 to ·4 in. *Racemes* 1 to 6 in. long, axillary, sometimes leafy, adpressed-pubescent. *Flowers* ·75 to 1 in. in diam., fragrant. *Sepals* obtuse, less than half as long as the petals. *Petals* fimbriate, the odd one dashed with yellow. *Fruit* with three coriaceous spreading wings, the middle one oblanceolate, obtuse, 1 to 2 in. long, the 2 lateral linear and half as large. Hook. fil. Fl. Br. Ind. I, 418; Kurz For. Flora Burma I, 173; Miq. Fl. Ind. Bat. I, Pt. 2, 585; DC. Prod. I, 583; W. and A. Prod. 107; Wight Ill. t. 50. *Molina racemosa*, Lamk. Dict. IV. 227; Cav. Diss. IX. t. 263. *Gærtnera racemosa*, Roxb. Cor. Pl. I. t. 18; Fl. Ind. II, 368.

Banisteria bengalensis, Linn. *B. unicapsularis*, Lamk. *B. tetraptera*, Sonnerat Voy. II, t. 135. Rheede Hort. Malab. VI, t. 59.

In all the provinces. DISTRIB. British India, China, Malayan Archipelago.

3. ASPIDOPTERYS, A. Juss.

Shrubs, usually climbing. *Leaves* opposite, eglandular, quite entire; stipules 0. *Flowers* in simple or compound axillary and terminal panicles; peduncles bracteate, jointed at the top, pedicels often minutely 2-bracteolate. *Flowers* small, yellow or white. *Calyx* short, 5-partite, eglandular. *Petals* 5, not clawed, spreading or reflexed, quite entire. *Stamens* 10, all perfect, filaments connate or distinct at the base. *Ovary* 3-lobed, lobes flattened at the back, sides winged; styles 3, glabrous, stigmas capitate. *Fruit* of 1–3 samaras; nucleus sometimes crested or winged at the back, and surrounded with a broad oblong or orbicular wing. *Seeds* oblong, subterete; embryo, straight, cotyledons equal, radicle short.—DISTRIB. Species about 15; all tropical Asiatic.

Leaves ovate or obovate, more or less orbicular; panicles slender, lax, with short few-flowered lateral branches: samaras ovate, narrowed and retuse at the apex ...	1 *A. concava.*
Leaves ovate or elliptic, narrowed upwards, not orbicular; panicles spreading, the branches umbellate, many-flowered: samaras orbicular	2 *A. Helferiana.*

1. ASPIDOPTERYS CONCAVA, A. Juss. in Archiv. Mus. Hist. Nat. III, 509. A climber; young shoots rusty-puberulous, soon becoming glabrous. *Leaves* ovate-elliptic or elliptic, bluntly and shortly acuminate, the base rounded or very slightly narrowed: both surfaces glabrous, the lower minutely dotted when young; main nerves 4 to 6 pairs, curving, ascending; length 3 to 4·5 in., breadth 1·5 to 2·3 in., petiole ·5 to ·65 in. *Flowers* in spreading lateral umbellate panicles. *Samaras* orbicular, membranous, pale, reticulate, the veins radiating, the nucleus winged, about 1·25 in. in diam; their pedicels slender, minutely bracteolate, often 1·5 in. long. Hook. fil. Fl. Br. Ind. I, 420; Kurz For. Flora Burmah, I, 175. *Hiraea concava*, Wall. Pl. As. Rar. I, 13; Cat. 1061. *H. merguensis*, Wight. Ill. I, 139.

Penang; Curtis No. 138, 798. DISTRIB. Burmah.

2. ASPIDOPTERYS HELFERIANA, Kurz Journ. As. Soc. Bengal, Pt. 2, (1874), 137, 184; For. Flora Burma, I., 176. A climber, the young shoots tawny-pubescent. *Leaves* membranous, orbicular-ovate to orbicular-obovate, the apex shortly cuspidate, the base rounded or slightly

cordate, glabrous; main nerves 4 or 5 pairs, curved, ascending; length 3 to 5·5 in., breadth 2·5 to 5 in.; petiole ·5 to ·65 in., puberulous or glabrescent. *Panicles* axillary or terminal, slender, lax, rusty-puberulous when young, the lateral branches distant, few-flowered; ovary quite glabrous, lobes of disc scarcely rugose. *Samaras* ovoid, narrowed towards the retuse apex, membranous, pale brown, with many radiating nerves, reticulate, glabrous, 1 in. or more in length, nucleus with oblong wing. *Hiraea indica* (?) Wall. Cat. 1057.

Andaman Islands. Distrib. Burmah.

The type of this species is one of the things included under Wall. Cat. 1057, with which the Andaman specimens in the Calcutta Herbarium agree very well. Kurz has however also referred to this species certain Burmese specimens, *viz.*, Falconer's No. 72 (from Upper Weingo Valley) and Helfer's No. 923, which, although agreeing with each other, hardly agree with the Wallichian No. 1057 from Neidann. By the way! this sheet from Neidann is not included in Wallich's lithographed and published list.

4. Brachylophon, Oliver.

Glabrous shrubs. *Leaves* opposite, entire. Inflorescence terminal, racemose or corymbose, bracteolate. *Flowers* yellow. *Calyx* 5-partite, eglandular. *Petals* 5, imbricate in bud. *Stamens* 10, all perfect, the alternate shorter; filaments longer than the anthers, flat, conjoined at the base into a short disc: anthers linear, basifixed, opening by 2 apical pores. *Ovary* deeply 3–4-lobed, 3–4-celled; *Styles* 3 or 4, elongate, slender, divergent: ovules solitary in each cell, pendulous, anatropous. *Fruit* usually 3-, sometimes only 2-lobed; separating when ripe into turgid cocci; each coccus keeled along the back, and at the apex produced into a very short wing. *Seed* unknown. Distrib. Three species; all Malayan.

Rachides of the racemes ·5 in. long or less, leaves coriaceous	1 *B. Hullettii.*
Rachides of the racemes 2 in. or more in length.	
Main nerves of leaves 7 to 8 pairs, oblique	2 *B. Curtisii.*
Main nerves of leaves 13 to 15 pairs, sub-horizontal	3 *B. Scortechinii.*

1. Brachylophon Hullettii, King. n. sp. *Leaves* coriaceous, shining, minutely reticulate, narrowly elliptic, shortly and abruptly acuminate or acute, the base cuneate: main nerves 10 to 12 pairs, rather prominent beneath, sub-horizontal, interarching far from the margin; length 4 to 7 in., breadth 1·8 to 2·5 in., petiole ·1 in. *Racemes* terminal, the

rachis less than ·5 in. long, 4-to 8-flowered; pedicels ·75 in. long, bracteolate at the base. *Sepals* ovate, blunt.

Malacca: on mount Ophir, Hullett.

An imperfectly known plant, easily distinguished from both the other species by its much shorter racemes and more coriaceous leaves.

2. Brachylophon Curtisii, Oliver in Hook. Ic. Plantar. t. 1566. A shrub 3 to 6 feet high. *Leaves* membranous, narrowly elliptic to ovate-rotund, acuminate, the base cuneate; upper surface glabrous, the lower scaberulous; main nerves 7 or 8 pairs, not much more prominent than the intermediate, oblique, interarching ·15 in. from the edge; length 3·5 to 7 in., breadth 2 to 2·25 in., petiole ·1 in. *Racemes* corymbose, 1 to 2 in. long. *Flowers* ·75 in. in diam.; pedicels slender, ·8 to 1·2 in. long, bracteolate at the base. *Petals* yellow, oblong, obtuse, entire, shortly clawed, ·5 in. long. *Ripe fruit* ·35 to ·5 in. long, ·25 in. broad.

Penang: Curtis No. 231.

3. Brachylophon Scortechinii, King, n. sp. A shrub 3 to 6 feet high. *Leaves* membranous, oblong-lanceolate to oblong-elliptic, sometimes oblong-oblanceolate, tapering from the middle to each end, both surfaces glabrous: main nerves 13 to 15 pairs, rather faint, sub-horizontal, interarching ·15 to ·2 in. from the edge: length 5 to 11 in., breadth 2 to 4 in., petiole ·15 in. *Racemes* corymbose, terminal and axillary, 2 to 3 in. long, many-flowered, the rachis tuberculate. *Flowers* about ·6 in. in diam.; pedicels slender, ·65 to 1 in. long, bracteolate at the base. *Calyx-teeth* oblong, obtuse, puberulous, the edges ciliolate. *Petals* ovate, obtuse, entire, glabrous, ·5 in. long. *Filaments* flattened, unequal but all much longer than the petals. *Ovary* 3- to 4-lobed, or 3- to 4-celled: styles 3 or 4, as long as the filaments, spreading, cylindric. *Fruit* unknown. *Ryssopteris elliptica*, Scortechini MSS.

Perak: Scortechini, Wray, King's collector.

I have not seen fruit of this. In its flowers it closely resembles *B. Curtisii*, Oliver, but its leaves are larger, more membranous, and have more numerous nerves than those of *B. Curtisii*.

Order XXII. GERANIACEÆ.

Herbs, undershrubs, or rarely trees; glabrous or more usually pubescent and glandular. *Leaves* opposite or alternate, usually 2-stipulate. *Peduncles* usually solitary and axillary, 1- or more flowered. *Flowers* umbelled, cymose or racemose, usually showy, hermaphrodite, regular or irregular. *Sepals* 5, rarely 4 or 2, free or united to the middle, imbricate or rarely valvate, the posticous sometimes spurred. *Petals* as many as the sepals or fewer by suppression, or 0, hypogynous or subperigynous, variously imbricated, rarely contorted. *Torus* scarcely

expanded into a disc, with 5 glands alternating with the petals, or without glands, raised in the centre into a beak, rarely flat. *Stamens* as many as, or double, or treble the sepals, or fewer by suppression; filaments filiform or dilated, or connate into a ring; anthers 2-celled; cells parallel, opening lengthwise. *Ovary* 3–5-lobed, 3–5-celled, rarely 2-lobed, of 3–5-carpels, united with the axis as far as the insertion of the ovules, sometimes lengthened into a beak-bearing style or styles, which are free or more or less united; stigmas capitate, linear or ligulate; ovules 1 or 2 or rarely more, horizontal or pendulous or ascending. *Fruit* capsular, 3–5-lobed, lobes 1-seeded, often separating from the axis, septicidal or loculicidal, rarely berried. *Seeds* pendulous or horizontal, albumen 0, or scanty or fleshy; embryo straight or curved; cotyledons flat, convex or variously folded, foliaceous or thick or fleshy; radicle either short and near the hilum, or longer and inflected, or incumbent on the cotyledons.—Distrib. Genera 20, with about 800 species, chiefly inhabiting temperate climates.

Oxalideæ.—Leaves compound, flowers regular.

Herbaceous.

Leaves 3-foliolate ... ... 1. *Oxalis.*

Leaves pinnate ... ... 2. *Biophytum.*

Woody.

Shrubs or trees, not scandent, fruit probably indehiscent ... ... 3. *Connaropsis.*

Scandent shrubs, fruit certainly dehiscent 4. *Dapania.*

Balsamineæ.—Leaves simple, flowers irregular.

Lateral petals connate in pairs, fruit capsular. 5. *Impatiens.*

Lateral petals free: fruit drupaceous ... 6. *Hydrocera.*

1. Oxalis, Linn.

Acid herbs, rarely shrubby. *Leaves* radical or alternate, stipulate or ex-stipulate, compound, usually 3-foliolate. *Flowers* on axillary, 1- or more flowered peduncles, regular. *Sepals* 5, imbricate. *Petals* 5, hypogynous, contorted. *Glands* of the disc 0. *Stamens* 10, free or united at the base, all anther-bearing. *Ovary* 5-lobed, 5-celled; styles 5, distinct; stigma terminal, captitate, 2-fid or laciniate: ovules 1 or more in each cell. *Capsule* with loculicidal dehiscence, valves persistent to the axis. *Seeds* with an outer fleshy coat which bursts elastically, testa crustaceous, albumen fleshy, embryo straight.—Distrib. Species about 200, chiefly tropical and temperate S. American and S. African.

1. Oxalis corniculata Linn. DC. Prod. I, 692. A diffuse, creeping, adpressed-pubescent herb with long-petioled 3-foliolate, stipulate

leaves; the leaflets obcordate, the stipules adnate to the petiole. *Flowers* sub-umbellate on 2- to many-fid, setaceously bracteolate peduncles. *Sepals* obtuse. *Petals* obcordate, yellow. *Fruiting pedicels* often depressed. *Capsules* sub-cylindric, tomentose, many-seeded. *Seeds* transversely striate. Hook. fil. Fl. Br. Ind. I, 436; Miq. Fl. Ind. Bat. I, pt. 2. p. 135; Boiss. Fl. Orient. i., 866; Wall. Cat. 4347; Roxb. Fl. Ind. ii. 457; W. & A. Prodr. 142. *O. repens*, Thunb; Wight Ic. t. 18; Blume Bijdr. 243. *O. pusilla*, Salisb.; Roxb. l.c.

Perak: by the sides of damp foot-paths near the bases of the hills. Penang: on Government Hill, Curtis.

2. Biophytum, De Cand.

Annual, rarely perennial herbs, with simple or branched stems. *Leaves* abruptly pinnate, fascicled or almost whorled at the top of the stem; leaflets opposite, oblique; petiole swollen at the base. *Peduncles* terminal, pedicels umbelled. *Flowers* small, yellow, or white. *Sepals* 5, lanceolate, acuminate. *Petals* 5. *Stamens* 10; filaments free, 5 outer smaller. *Styles* 5, stigmas notched at the apex or 2-fid. *Capsule* ovoid or oblong, or subglobose, splitting loculicidally sometimes to the base into 5 spreading valves. *Seeds* as in *Oxalis*.—Distrib. Tropical Asia, Africa, and America. Species about 20.

Leaflets 8 to 20 pairs, equal-sided, glabrous, their bases truncate, slightly oblique: flower-pedicels usually shorter than the sepals, petals yellow ... ... 1. *B. sensitivum.*

Leaflets 18 to 25 pairs, unequal-sided, sparsely hispid on upper surface, their bases obliquely truncate; flower-pedicels longer than the sepals, petals white... ... ... 2. *B. adiantoides.*

1. Biophytum sensitivum, DC. Prod. I, 690. Stem 4 to 10 in. long, hispidulous, erect or decumbent, bearing at its apex 8 to 20 pinnate leaves 1·5 to 5 in. long; leaflets 6 to 15 pairs, the lower pairs oblong, the upper pair obovate-oblong, the apices of all obtuse, sometimes mucronate, the bases truncate, subequal, glabrous, ·25 to ·5 in. long. *Peduncles* variable in length, sometimes nearly as long as the leaves, puberulous, each bearing at its apex a bracteolate umbel of 10 or 12 flowers; bracteoles setaceous, as long as the flower pedicels, pedicels pubescent, as long as the sepals. *Petals* yellow. Hook. fil. Fl. Br. Ind. I, 436; Roxb. Fl. Ind. II, 457; W. and A. Prod. 162; Bot. Reg. XXXI, t. 68; Wall. Cat. 4343 C. E.

Malacca: Griffith. Penang, on the coast, Curtis; and probably in the other provinces.

2. Biophytum adiantoides, Wight ex Hook. fil. Fl. Br. Ind. I, 437. Stem from 6 to 12 in. high, erect or decumbent, pubescent, bearing at its apex 10 or 12 pinnate leaves 4 to 7 in. long; leaflets 18 to 25 pairs, oblong, obtuse, unequal-sided, the apex mucronate, the base obliquely truncate, sometimes auriculed at the upper margin, sparsely strigose on the upper surface. *Peduncles* more than half as long as the leaves, pubescent, each bearing at its apex a densely bracteolate umbel of 6 to 12 flowers; bracteoles short, setaceous: flower-pedicels slender, puberulous, longer than the sepals. *Petals* white, the claws yellow.

Perak: on the banks of the Kamha river, King's collector, No. 931; on the Plus river, Wray No. 3363. Goping, Scortechini, No. 1999. Distrib. Burmah.

3. Connaropsis, Planch.

Trees or shrubs. *Leaves* pinnately 1–3-foliolate; leaflets coriaceous, quite entire, strongly nerved, triple-nerved at the base, margined. *Flowers* minute, regular, in terminal and axillary panicled cymes. *Sepals* 5, imbricate, connate at the base. *Petals* 5, imbricate. *Glands* 0. *Stamens* 10, filaments united at the base, the alternate shorter. *Ovary* 5-angled, 5-celled; styles 5, subulate, more or less united below, stigmas apiculate; ovules 2 in each cell. *Fruit* fleshy, 5-lobed or 5-angled with succulent epicarp and fibrous endocarp, 1- or 2-celled and 1- or 2-seeded by abortion, indehiscent. Distrib. Five species, all Malayan.

Leaves 3-foliolate ... ... 1. *C. Griffithii.*
Leaves 1-foliolate.
Leaves 2 to 3·5 in. long ... ... 2. *C. monophylla.*
Do. 6 to 12 in. long ... ... 3. *C. macrophylla.*

1. Connaropsis Griffithii, Planch. in Hook. fil. Fl. Br. Ind. 440. A small tree; young shoots glabrescent, dark-coloured when dry. *Leaves* pinnately trifoliolate, coriaceous, glabrous; leaflets elliptic-lanceolate, acuminate, the base cuneate; main nerves 4 pairs, ascending: length 2 to 3·5 in., breadth ·5 to 1 in., petiolule ·15 in. *Panicles* terminal, minutely ferruginous-tomentose, 1·5 to 2 in. long. *Fruit* unknown.

Malacca: Griffith, No. 1667. Maingay (Kew Distrib.), No. 274.

2. Connaropsis monophylla, Planch. Hook. fil. Fl. Br. Ind. I., 440. A shrub or small tree; young shoots minutely ferruginous-pubescent. *Leaves* 1-foliolate, coriaceous, glabrous, ovate, acuminate, the base rounded or sub-cuneate: main nerves about 6 pairs, faint; length 2 to 3·5 in., breadth ·8 to 1·5 in.; petiole ·6 to ·8 in., thickened and pointed towards the apex. *Panicles* terminal or lateral, 2 to 4 in. long, ferruginous-tomentose; the branches erect and spike-like; flowers

crowded. *Fruit* ovoid, glabrous, obtusely 5-angled and furrowed, ·3 in. long.; endocarp fibrous, sarcocarp fleshy.

Malacca; Griffith No. 947; Maingay (Kew Distrib.) as 273. Perak, Scortechini, King's collector, Wray.

3. CONNAROPSIS MACROPHYLLA, King n. sp. A shrub or small tree: young branches glabrescent or glabrous. *Leaves* 1-foliolate, coriaceous, glabrous, oblong, acute or shortly acuminate, scarcely narrowed to the rounded sub-truncate or sub-emarginate base; main nerves 8 or 9 pairs, spreading, the reticulations distinct beneath: length 6 to 12 in., breadth 2·35 to 3·65 in.; petiole ·5 in., jointed above the middle. *Flowers* in two or three terminal or lateral spikes which are sometimes united to form a kind of panicle. *Spikes* glabrescent, 2 or 3 in. long. *Flowers* crowded. *Fruit* ovoid, apiculate, glabrous, about ·3 in. long.

Perak: King's collector, Nos. 433, 3124; Ridley No. 3087. Province Wellesley; Curtis No. 474.

4. DAPANIA, Korthals.

Woody climbers. *Leaves* alternate, simple, coriaceous, entire, the petiole jointed about the middle. *Flowers* small, regular, sometimes unisexual, in slender spike-like racemes which are solitary, or in fascicles, axillary or from tubercles on the stem. *Sepals* 5, connate at the base, imbricate. *Petals* 5, hypogynous, imbricate, longer than the sepals. *Stamens* 10, the alternate 5 shorter, all united at the base into a shallow tube. *Ovary* deeply 5-lobed, 5-celled, each cell usually with 1 (sometimes with 2) pendulous ovule from an axile placenta. *Fruit* clavate, the calyx persistent but not enlarged, deeply 5-lobed, the epicarp slightly fleshy, the endocarp fibrous, 5-celled, 5-seeded, dehiscing loculicidally so as to form a five-rayed fibrous star with a seed attached to the central ridge (placenta) of each segment. DISTRIB. About 4 species; all Malayan.

1. DAPANIA SCANDENS, Stapf in Hook. Ic. Pl., t. 1997. A glabrous climber 50 to 100 feet long. *Leaves* ovate-elliptic, acuminate, the base rounded; main nerves 4 or 5 pairs, ascending, faint, length 3 to 5 in., breadth 1·25 to 2 in.; petiole ·25 to ·35 in., jointed about the middle. *Racemes* slender, puberulous, about 1·5 to 2·5 in. long. *Flowers* some hermaphrodite and some with stamens only, ·1 to ·15 in. long, each with a minute ovate bracteole at the base of its short pedicel. *Calyx-lobes* obtuse, ciliolate. *Petals* oblong, ob-lanceolate, twice as long as the calyx. *Fruit* 3 in. long, dehiscing into a flat star-shaped mass 4 in. in diam. *Connaropsis dioica*, Scortechini MSS. in Herb. Calcutta.

Perak: Curtis. Scortechini, Wray, King's collector.

By far the majority of the flowers have stamens only, the pistils

being either quite rudimentary or absent: these male flowers are about half as long again as the hermaphrodites. The genus *Dapania* was founded by Korthals to receive the Sumatran plant which that author called *D. racemosa*. Of this, there is an authentic specimen in the Calcutta Herbarium; but unfortunately it has neither flowers nor fruit. Amongst Forbes' plants collected in Sumatra, No. 1217 agrees so perfectly with Korthal's *D. racemosa* in foliage, as to leave no doubt that it belongs to the same species; and on Forbes' specimens there are ripe fruits. These ripe fruits, as well as its leaves, show *D. racemosa* to be quite distinct from *D. scandens*, Stapf, the leaves being thinner in texture, and the fruits longer than those of *D. scandens*. The seeds of Forbes' specimens do not, however, show the curious aril (laciniate and almost 2-lipped) which Korthals describes: and, as the seeds of *D. scandens* show no trace of an aril, I agree with Dr. Stapf that Korthals probably described the existence of an aril as the result of some confusion. The majority of the ovaries dissected by me have only a single ovule: in one or two cases, however, a second (as figured by Dr. Stapf) has been found. In no case, however, have I found two seeds in a loculus of the fruit. There is no doubt that, as Dr. Stapf points out, the genus *Connaropsis* comes very near *Dapania*; and it may become desirable, as both genera became better known, to reduce *Connaropsis* (which dates only from 1862) to *Dapania* which was published in 1854. In the meantime the fruit of *Connaropsis* is not properly known, and there is no evidence that it is dehiscent. The fruit of *C. monophylla* is very like that of *Dapania scandens*, but no specimens that I have seen show any sign of dehiscence; while that of *C. macrophylla* is but little angled externally and the appearance of all the specimens I have seen is suggestive of indehiscence. Moreover, all the species of *Dapania* appear to be scandent; while all those of *Connaropsis* are shrubby or arboreous. Concerning the structure of the seeds I can say nothing, not having met with good seeds of either. The two genera remain at present separated chiefly by these two points of difference, *viz.*, dehiscence of the fruit and habit. Whether others may be found remains to be seen when better materials shall be obtained.

Beccari's specimen (P. S. 900) appears to belong to a species slightly different from either *D. scandens* or *D. racemosa*. And, as I understand from Dr. Stapf, the same Collector's No. 2951, from Borneo (which I have not myself examined), belongs to still another species.

5. Impatiens, Linn.

Herbs, rarely shrubby at the base. *Leaves* opposite or alternate, in some whorled, in others all radical, simple, exstipulate, or with

stipular glands at the base of the petiole. *Flowers* in scapes, or in axillary or terminal 1–2 or many-flowered peduncles, irregular, resupinate. *Sepals* 3, rarely 5, imbricate; 2 anterior when present minute; 2 lateral small, flat, usually green; posterior (anterior in flower) large, petaloid, produced into a hollow spur or sac. *Petals* 3 (or 5); anterior (outer in bud) large; lateral 2-lobed (or 2 connate). *Stamens* 5, filaments short, broad; anthers cohering. *Disc* 0. *Ovary* oblong, 5-celled; stigma sessile, 5-toothed; ovules many, 1-seriate in each cell. *Capsule* loculicidal; valves 5, elastically springing away from a placentiferous axis. *Seeds* smooth or tubercled, glabrous or hairy, albumen 0; embryo straight.—Distrib. Mountainous parts of Trop. Asia and Africa, rare in Temp. Europe, N. America, N. Asia, and S. Africa; species about 200.

Flowers yellow: stem fleshy, several feet high and more than a foot in diam. at the base ... 1. *I. mirabilis.*

Flowers lilac, purple or white: stems herbaceous, slender.

Leaves linear-lanceolate, the upper whorled, the lower in pairs, opposite... 2. *I. Griffithii.*

Leaves linear-oblong to obovate or rotund, all opposite ... ... 3. *I. chinensis.*

1. Impatiens mirabilis, Hook. fil. in Curtis's Bot. Mag., t. 7195. Stem fleshy, cylindric, 3 to 5 feet high and 18 to 20 in. in diam. at the base, branched above. *Leaves* thinly fleshy, crowded at the ends of the branches, much narrowed to the base, obovate to ovate, crenate, with a thick fleshy midrib and 13 or 14 pairs of faint pinnate nerves, both surfaces glabrescent: length 5 to 7 in., breadth 3·5 to 4·5 in., petiole 1 to 1·5 in. *Racemes* axillary, as long as, or longer than the leaves, slender, and few-flowered. *Flowers* yellow, 1·75 in. long, sepals 3; the lateral elliptic-oblong, acute; the posterior widely hemispheric with a short incurved spur; anterior petal rotund, transversely oblong, the lateral petals united into a single 3-lobed piece.

Langkani: Curtis No. 1678.

The above description of this very remarkable species is chiefly copied from Sir Joseph Hooker.

2. Impatiens Griffithii, Hook. fil. and Thoms. in Journ. Linn. Soc. IV, 120: Fl. Br. Ind. I, 445. Herbaceous; stem a foot or more in height, erect, terete, sparsely puberulous. *Leaves* linear-lanceolate, much narrowed towards the base, those in the lower part of the stem in pairs, opposite and petiolate; those in the upper part narrower, in whorls of three and sessile; all remotely serrate-toothed, 1·5 to 4 in. long; the texture rather thick, the lower surface pale and glabrous, the upper sparsely hairy. *Pedicels* solitary, rarely paired, slender,

1 in. or more in length. *Flowers* 1 in. in diam., flattish, rose-lilac. *Sepals* ovate-oblong, acuminate: standard broadly obcordate with a filiform spur behind, the wings broadly bi-lobed. *Capsule* elliptic, turgid in the middle.

Malacca: on Mount Ophir, Gerai, &c.; Griffith, Maingay.

3. Impatiens chinensis, Linn. Herbaceous: stem 4 to 18 in. long, suberect, decumbent and rooting at the base, angled. *Leaves* subsessile, varying from linear-oblong to obovate or almost rotund, acute or obtuse, sharply serrate, always opposite, the base acute or rounded, often auricled; texture rather thick, glaucous beneath, glabrous or sparsely hairy, ·5 to 4 in. long: stipules setaceous, glandular, recurved. *Flowers* ·5 to 1 in. in diam., flattish, purple, or white. *Pedicels* solitary or fascicled, sometimes longer than the leaves. *Sepals* linear: standard orbicular, the wings semi-obovate, entire, auricled at the base; spur slender, long, incurved. *Capsule* ·5 to ·75 in. long, elliptic, turgid in the middle.

Malacca; Griffith. Distrib. China, British India.

6. Hydrocera, Blume.

A glabrous erect marsh herb. *Leaves* narrow, alternate. *Flowers* in short axillary 1–2-flowered peduncles, irregular. *Sepals* 5, coloured, imbricate; 2 outer lateral, flat; posticous one produced into a short hollow spur. *Petals* 5, the anticous outer, very large, concave. *Disc-glands* 0. *Stamens* 5; filaments short, flat; anthers slightly cohering around the pistil. *Ovary* 5-celled; stigmas 5, sessile; ovules 2–3 in each cell. *Drupe* baccate, endocarp bony, truncate, 5-celled, cells 1-seeded *Seeds* curved, corrugated, albumen 0; cotyledons plano-convex, thickish, radicle short, superior.—Distrib. One tropical Asiatic species.

1. Hydrocera triflora, W. & A. Prod. I, 140. Annual; the stem often floating, fistular, often flexuose and rooting at the nodes; branches erect, 1 to 2 feet long, 5-angled. *Leaves* linear-lanceolate, serrate, attenuated into a petiole at the base, stipulate, glands two. *Flowers* 1 in. in diam., red white and yellow. *Drupe* globose, ·75 in. in diam., smooth, red, when dry 5-angled and truncate. Hook. fil. Fl. Br. Ind. I, 483; Miq. Fl. Ind. Bat. I, Pt. 2, 132; H. f. & T. in Journ. Linn. Soc. iv. 156. *H. angustifolia*, Blume Bijd. 241. *Impatiens triflora*, Linn. DC. Prodr. i. 687; Wall. Cat. 4756. *I.? natans*, Willd.; DC. Prodr. i. 687; Roxb. Fl. Ind. i, 652; Wall. Cat. 4755. *Tytonia natans*, G. Don, Gen. Syst. i. 749. *Balsamina angustifolia*, Burm. Thes. Zeyl. t. 16 fig. 2 (*inaccurate*).

In all the Provinces except the Andaman and Nicobar Islands. Distrib. Malayan Archipelago, British India, Ceylon.

Order XXIII. RUTACEÆ.

Trees or shrubs, rarely herbs, abounding in pellucid glands filled with essential oil. *Leaves* opposite or alternate, simple or compound, exstipulate. *Flowers* in axillary or terminal cymes or panicles, never spiked, usually bisexual and regular in the Indian species. *Calyx* of 4–5 small lobes or sepals. *Petals* 4–5, hypogynous (in the Indian genera), valvate or imbricate. *Stamens* 4–5 or 8 or 10, rarely more (*Citrus*, *Ægle*); filaments usually free, hypogynous; anthers 2-celled, opening inwards. *Disc* within the stamens, crenate or lobed, sometimes large or long. *Ovary* of 4–5 free or connate carpels; styles as many, free or variously united; stigmas terminal, entire or lobed; ovules usually 2 in each cell. *Fruit* a capsule, berry or drupe, or 1–4 capsular cocci. *Seeds* usually solitary in the cells, testa various, albumen fleshy or 0; embryo straight or curved, radicle superior.—Distrib. Tropical and extratropical. Genera 83, and about 70 species.

Ripe fruit separating into dehiscent cocci or follicles.
- Flowers generally unisexual; disc free or absent; ovaries partially united; styles basilar or ventral, free at the base; cells 2-ovuled.
  - Leaves opposite.
    - Stamens 4 or 5 ... ... 1. *Evodia.*
    - Stamens 8, four perfect opposite the sepals, alternating with four imperfect opposite the petals... 2. *Tetractomia.*
    - Stamens 8, all perfect ... 3. *Melicope.*
  - Leaves alternate, stamens 3 to 5 ... 4. *Zanthoxylum.*

Ripe fruit indehiscent.
- Flowers polygamous: petals 4, stamens 8; disc free: ovaries and styles 4, united, the cells 2-ovuled; fruit syncarpous, 4-celled, indehiscent, seed albuminous; leaves 1-foliolate ... ... 5. *Acronychia.*
- Flowers hermaphrodite, petals and stamens free or connate, ovaries and styles completely united, cells 1-to many-ovuled: fruit a berry, sometimes with but little pulp, seed exalbuminous
  - Unarmed.
    - Style short, persistent; leaves 1 to 5-foliolate ... ... 6. *Glycosmis.*

Style deciduous, leaves pinnate.
Cotyledons leafy, crumpled; petals valvate; filaments linear-subulate, not dilated at the base ... ... 7. *Micromelum.*
Cotyledons fleshy, plano-convex, petals imbricate.
Filaments not dilated at the base... ... 8. *Murraya,*
Filaments dilated at the base ... ... 9. *Clausena.*

Armed; leaves 3-to 8-foliolate.
Calyx 3-lobed, petals 3, stamens 6 10. *Triphasia.*
Calyx cup-shaped, entire or obscurely lobed: petals 4, stamens 8 to 10 ... ... 11. *Luvunga.*

Armed or unarmed; leaves 1-foliolate.
Anthers linear-oblong, disc cylindric forming a gynophore ... 12. *Paramignya.*
Anthers ovate-oblong, sometimes cordate, the filaments free or conjoined into a tube; disc cupular ... ... 13. *Atalantia.*

1. Evodia, Forst.

Trees or shrubs, unarmed. *Leaves* opposite, simple or 1–3-foliolate or imparipinnate, quite entire. *Flowers* small, in panicled axillary cymes, unisexual. *Sepals* 4–5, imbricate. *Petals* 4–5, sessile, valvate or slightly imbricate. *Stamens* 4–5, inserted at the base of the disc, filaments subulate, anthers oblong. *Ovary* deeply 4-lobed, 4-celled; style basilar, stigma 4-lobed, ovules 2 in each cell, collateral or superposed. *Fruit* of 2 to 4 coriaceous 1 to 2-seeded cocci; endocarp horny, elastic. *Seeds* oblong or globular, testa bony or crustaceous, shining; hilum linear, albumen fleshy; embryo straight, cotyledons ovate.—Distrib. About 25 species, natives of tropical Asia, the Pacific, the E. African Islands, and Australia.

Leaves 3-foliolate.
Leaflets usually more or less obovate: cymes broad pyramidal or corymbose, much branched.
Lower surface of leaflets pubescent... 1. *E. latifolia.*

Lower surface of leaves glabrous.
Apices of leaflets acuminate or apiculate, main nerves rather faint, sub-horizontal or slightly ascending; cymes pyramidal... 2. *E. Roxburghiana.*
Apices of leaflets shortly and abruptly acuminate, main nerves rather faint, sub-horizontal or ascending, cymes corymbose ... ... 3. *E. glabra.*
Apices of leaflets obtuse, nerves very prominent beneath, cymes corymbose ... ... 4. *E. robusta.*
Leaflets oblong or elliptic-oblong, not at all obovate, tapering little to the ends: ripe cocci ·4 in. long ... ... 5. *E. macrocarpa.*
Leaflets oblong-elliptic, tapering to each end: cymes few-branched, very tomentose: flowers in globular masses ... 6. *E. pilulifera.*
Leaflets oval to elliptic, obtuse or subacute, very coriaceous, the edges revolute when dry: cymes small, flowers ·25 in. long ... ... 7. *E. pachyphylla.*
Leaves 1-foliolate ... ... 8. *E. pedunculosa.*

1. Evodia latifolia, DC. Prod. I., 724. A tree 15 to 20 feet high: young branches stout, obscurely 4-angled, flattened at the nodes, rusty or tawny-puberulous. *Leaves* 3-foliolate, membranous, the petiole 4 to 6 in. long, usually angled, puberulous; leaflets obovate-elliptic to elliptic, acute or shortly acuminate, the base cuneate; main nerves 13 to 18 pairs, spreading, curving, prominent beneath; upper surface glabrescent or glabrous except the tomentose midrib and nerves, the lower softly pubescent, sometimes becoming glabrescent when old; length 5 to 9 in., breadth 2·5 to 4·5 in. (the middle one usually the largest); petiole ·2 to ·4 in. *Cymes* axillary, broad, with opposite spreading rusty-tomentose branches on stoutish puberulous peduncles 1 to 2 in. long. *Flowers* less than ·1 in. long, densely crowded; sepals sub-acute, pubescent outside; petals glabrous except a few hairs on the back outside; ovary villous. *Cocci* 2 or 3 from each flower, broadly ovate, blunt, subglabrous, 1–2-seeded: seed black. Hook. fil. Fl. Br. Ind. I., 489; Miq. Fl. Ind. Bat. i. pt. 2, 672; Ann. Mus. Lugd. Bat. iii, 244. *Zanthoxylum Rumphianum*, Cham. in Linnæa v. 58.

In all the provinces, except the Andamans and Nicobars: Distrib. Malayan Archipelago.

In its flowers and fruit this closely resembles *E. Roxburghiana*, Benth., but the leaves are different.

2. Evodia Roxburghiana, Benth. Flora of Hong-Kong, 59. A small tree; branches glabrous, opposite. *Leaves* glabrous, 3-foliolate, the petiole 2 to 5 in. long, terete; leaflets thinly coriaceous, shortly petiolulate, obovate, oblanceolate or oblong, the apex rounded acuminate or apiculate: main nerves 12 to 18 pairs, horizontal or slightly ascending, not prominent; length 2·5 to 6 in., breadth 1·25 to 3·25 in., the middle leaflet the largest; petiolule ·15 to ·25 in. *Cymes* pedunculate, spreading; the branches opposite, minutely bracteolate at the base: peduncles 2 to 3 in. long: cymes about 2·5 to 3 in. in diam. *Flowers* densely crowded, whitish, ·1 to ·15 in. long; the anthers exserted, shortly pedicelled, sepals very obtuse, ovary pubescent. *Cocci* about 2 from each flower, ovoid, pointed, 1-to 2-seeded, ·2 to ·3 in. long. *Seeds* black, shining. Hook. fil. Fl. Br. Ind. I, 487; Kurz Fl. Burm. I, 180. *E. triphylla*, Bedd. Flor. Sylvat; Anal. Gen. xli. t. vi. f. 2. *E. Marambong*, Miquel Ann. Mus. Bot. iii. 244. *Fagara triphylla*, Roxb. Fl. Ind. i. 416 (? of Linn.). *F. Lunur-ankenda*, Gærtn. Carp. i., 334, t. 68. f. 9. *Xanthoxylon triphyllum*, Wight Ic. t. 204; Ill. i. 169; Grah. Cat. Bomb. Pl. 36; Dalz. & Gibs. Bomb. Flor. 45. *X. Roxburghianum*, Cham. in Linnæa v. 58. *X. zeylanicum*, DC. Prodr. i., 728. *X. nilagiricum*, Miquel Herb. Hohenack.

In all the Provinces: common. Distrib. Malayan Archipelago, British India.

A widely distributed species very common in most parts of the Malayan Peninsula, and varying a good deal in the size of the leaves and in the degree of density of the cymes. In some cases the latter are lax and open, but in the majority they are condensed. There is some doubt as to what name this plant should bear. Sir Joseph Hooker (F. B. I. l. c.) has written an excellent note on its synonymy which should be consulted. The species, except in the matter of size, differs very little from *E. triphylla*. DC.

3. Evodia glabra, Blume Bijdr. 245. A tree 40 to 70 feet high: young branches stout, compressed at the nodes, glabrous. *Leaves* 3-foliolate; the petioles 2 to 4 in. long, glabrous, terete, grooved in front towards the apex: leaflets more or less coriaceous, shortly petiolulate, obovate or obovate-elliptic, shortly and abruptly acuminate, rarely obtuse, always tapering much to the base, upper surface shining, the lower glabrous or puberulous: main nerves 10 to 15 pairs, oblique or sub-horizontal, prominent on the lower surface and often depressed on the upper when dry; length 4 to 10 in., breadth 2·25 to 5 in., petiolule ·2 to ·4 in., the middle leaflet the largest and with the longest petiolule.

Cymes pedunculate, corymbose, the main branches ascending, the secondary spreading, all opposite, minutely bracteolate at the base, puberulous or almost glabrous; peduncles stout, compressed, glabrescent, 1·5 to 4 in. long. *Flowers* ·1 in. long (excluding the exserted stamens) densely crowded, many of them practically unisexual, the ovary being abortive. *Sepals* sub-orbicular, obtuse, puberulous. *Petals* glabrous. *Stamens* exserted. *Ovary* depressed, glabrous, or hairy at the base of the styles. *Cocci* 2 or 3 to each flower, ·2 in. long, rugulose and glandular externally, broadly ovate, obtuse. *Seeds* black. Miq. Fl. Ind. Bat. I, Pt. 2, 672; Ann. Mus. Lugd. Bat. III, 243; Hook. fil. Fl. Br. Ind. I, 489.

Perak: very common. Penang, Curtis, No. 2485. Andaman Islands, King's collectors. Nicobars, Kurz.

This is best distinguished from *E. Roxburghiana* and *E. latifolia* by its more coriaceous leaves with stronger nerves, and by its more corymbose cymes. The flowers, however, are very little different in all three, and it seems doubtful whether it would not be better to treat all as forms of a single widely distributed and variable species.

4. Evodia robusta, Hook fil. Fl. Br. Ind. I., 488. A small tree; young branches as thick as a swan's quill, compressed, hoary. *Leaves* 3-foliolate, the petiole 4 in. long, terete, as thick as a crowquill: leaflets coriaceous, elliptic, the terminal sub-obovate, obtuse or obtusely acuminate, the midrib and arching nerves very strong, glabrous except the puberulous midrib beneath, the upper surface shining; length 6 to 8 in. *Cymes* broad, (5 in. in diam.), brachiate, their branches very robust. *Flowers* and fruit as in *E. Roxburghiana*.

Penang; Phillips. Singapore; Maingay (Kew Distrib.) No. 278.

This species must come very near *E. glabra*, Bl. It also greatly resembles the Sumatran *E. euneuron*, Miq. (Fl. Ind. Bat. Suppl. 532).

5. Evodia macrocarpa, King, n. sp. A tree 20 to 40 feet high: young branches rather stout, cinereous-puberulous, compressed. *Leaves* 3-foliolate, the petiole 3 to 4 in. long, glabrous: leaflets coriaceous, oblong, or elliptic-oblong, acute, narrowed to the slightly unequal-sided base; both surfaces glabrous, the upper shining, the lower dull and paler when dry; main nerves 14 to 18 pairs, almost horizontal, faint; length 6 to 12 in., breadth 2 to 3 in., petiole ·1 to ·2 in.; the middle leaflet the largest. *Cymes* axillary, pyramidal, shortly pedunculate, olivaceous-tomentose; the branches opposite, spreading, bracteolate at the base; peduncles ·5 to 1·5 in. long, puberulous *Flowers* ·1 in. long, densely crowded, many of them with perfect stamens but an abortive ovary; sepals triangular, acute, pubescent; petals puberulous. *Stamens* exserted. *Ovary* villous. *Cocci* 3 or 4 to each flower, compressed, obovate, blunt, ·4 in. long, dark-coloured and

puberulous externally, lined inside with dense white hairs: seeds 2, black, shining.

Perak: Wray, No. 2648 and 3266; King's collector, No. 7489.

A very distinct species, recognisable at once by its long and comparatively large leaflets, small cymes, and large cocci.

6. Evodia pilulifera, King n. sp. A shrub 10 to 15 feet high: young branches rather slender, flattened at the nodes, minutely tawny-tomentose, the bark pale. *Leaves* 3-foliolate, the petiole 3 to 4·25 in. long, terete, grooved in front, deciduously tawny-tomentose; leaflets thinly coriaceous, petiolulate, oblong-elliptic, tapering to each end, the apex shortly acuminate, the base very narrow; both surfaces glabrous, the lower paler when dry: main nerves 9 or 10 pairs, oblique, interarching boldly well within the edge, prominent on the lower, depressed on the upper surface when dry; length 3·5 to 8 in,; breadth 1·25 to 2·75 in.; petiolule ·15 to ·4 in., the middle leaflet rather larger than the lateral. *Cymes* everywhere tawny-tomentose, axillary, on long peduncles; the branches few, opposite, each bearing towards the apex a few dense sub-globose masses of flowers. *Flowers* less than ·1 in. long. *Sepals* ovate, acute, densely tawny-tomentose. *Petals* glabrous. *Ovary* villous. *Cocci* slightly compressed, ovoid, blunt, minutely tawny-tomentose outside, the interior glabrous, ·2 in. long. *Seed* solitary, shining.

Perak: Scortechini, No. 360; Wray, No. 2995; King's collector, No. 6275.

This species is readily distinguished by its minutely tomentose few-branched cymes, each bearing a few densely crowded heads of small flowers.

7. Evodia pachyphylla, King n. sp. A small tree 10 to 15 feet high; young branches flattened at the nodes, minutely rufous-tomentose, as are the petiole, under surfaces of the midribs and peduncles of the cymes. *Leaves* 3-foliolate, the petiole 2·5 to 3 in. long: leaflets very coriaceous, oval to elliptic, obtuse or sub-acute, the base slightly cuneate, the edges revolute when dry; upper surface glabrous, shining, the lower pale, glaucous; main nerves 8 to 12 pairs, sub-horizontal, curving slightly, interarching within the edge, slightly prominent on the lower surface when dry, the midrib very bold; length 2·25 to 3·75 in., breadth 1·2 to 2·25 in., petiolule ·35 to ·5 in. *Cymes* axillary, pedunculate, the branches few, short, close together; peduncles 1 to 1·5 in. long. *Flowers* 25 in. long, in dense sub-globular masses. *Sepals* broadly ovate, acute, olivaceous-tomentose externally, glabrous internally. *Petals* erect, ovate-lanceolate, pubescent on both surfaces, the edges glabrous. *Stamens* not exserted. *Ovary* glabrous. *Cocci* 2 or 3 from each flower, sub-compressed, ovate, blunt, pale and puberulous externally, glabrous within. *Seed* solitary, black, shining.

A very distinct species, at once distinguishable by its small coriaceous leaflets and large flowers and fruits.

8. Evodia pedunculosa, Hook. fil. Fl. Br. Ind. I, 489. A small tree? young branches cylindric, smooth. *Leaves* 1-foliolate; petiole rather stout, half-cylindric, ·5 to 1 in. long. *Leaflets* coriaceous, obovate, abruptly narrowed at the obtuse apex, the base cuneate: both surfaces glabrous, minutely reticulate, main nerves numerous, slender, spreading, length 4 to 5 in. *Cymes* pedunculate, pubescent, branching near the apex into small trichotomous pubescent cymules; peduncles 1 to 4 in. long. *Flowers* (buds only seen) ·1 in. long, shortly pedicelled. *Sepals* rounded. *Petals* broadly ovate, acute, glabrous. *Ovary* 4-cleft, immersed in the disc.

Singapore; Lobb.

Known only from Lobb's solitary and imperfect specimen.

2. Tetractomia, Hook. f.

Trees or shrubs. *Leaves* opposite, petioled, 1-foliolate, coriaceous, quite entire, punctate. *Flowers* small, in axillary branched cymes. *Calyx* small, 4-partite. *Petals* 4, triangular-ovate, acute, persistent, valvate. *Disc* broad, glandular, flattish or pulvinate, obtusely 4-angled. *Stamens* 4 or 8, (4 perfect alternate with the petals, 4 smaller with imperfect anthers opposite the petals and partially adnate to them at the base); filaments subulate, flattened at the base; anthers 2-lobed, dorsifixed. *Ovary* immersed in the centre of the disc, 4-celled, with 4 free projecting lobes; styles 4, free at the base, connate above; stigma capitate, obscurely 4-lobed; ovules 2, collateral in each cell. *Fruit* of 4 coriaceous, laterally compressed, oblong, 2-seeded cocci, splitting ventrally, the horny endocarp partially separating. *Seeds* inserted towards the base of the carpels.—Distrib. Three species, natives of the Malayan Peninsula and Borneo.

Leaves elliptic-obovate, 6 to 9 in. long; flowers ·25 in. long: ripe cocci ·5 in. long ... 1 *T. majus.*

Leaves usually cuneate-obovate, rarely elliptic-obovate, 2·5 to 5 in. long; flowers 1·3 in. long; ripe cocci ·25 in. long ... ... 2 *T. Roxburghii.*

1. Tetractomia majus, Hook. fil. Fl. Br. Ind. I. 491. A tree: young branches stout; their bark brown, rough. *Leaves* very coriaceous, obovate, elliptic, obtuse, narrowed to the base; both surfaces glabrous, very pale when dry: main nerves 12 to 16 pairs, rather straight, oblique, interarching far from the margin, slightly prominent on both surfaces when dry; length 6 to 9 in., breadth 3 to 4 in., petiole 2 to 2·25 in., stout, terete, slightly swollen at base and apex.

Cymes glabrous or glabrescent, 4 to 6 in. in diam., the branches opposite; bracts minute, persistent. *Flowers* ·25 in. in diam., glabrous. *Stamens* 4, perfect; the *filaments* longer than the petals and style, the 4 staminodes minute. *Ripe cocci* about ·5 in. long, keeled. *Seeds* oblong, the nucleus basal, much smaller than the oblong wing. *Tetramerista paniculata*, Kurz in Journ. Bot for 1875, p. 333.

Malacca; Maingay (Kew Distrib.) No. 290.

A rare plant known only by Maingay's scanty specimens.

2. Tetractomia Roxburghii, Hook. fil. Fl. Br. Ind. I., 491. A tree 30 to 80 feet high; young branches rather stout, glabrous, their bark pale, rough. *Leaves* coriaceous, cuneate-obovate, sometimes obovate-elliptic, the apex always broad and rounded, and very shortly and bluntly apiculate, much narrowed to the petiole; both surfaces glabrous, rather pale when dry, the upper glabrous, the lower glabrescent with numerous and rather large black dots: main nerves 7 to 9 pairs, oblique, straight, not prominent: length 2·5 to 5, rarely 6 in., breadth 1·5 to 2·5, rarely 3 in.; petiole ·5 to 1 in., rarely 1·25 in. *Cymes* glabrous in the lower, pubescent in the upper part, 3 or 4 in. in diam., pedunculate; bracts minute, persistent. *Flowers* ·13 in. in diam., puberulous. *Stamens* 8, the alternate row imperfect, minute and attached to the petals. *Ripe cocci* 1 to 3 from a flower, about ·25 in. long *Seeds* oblong, nucleus rather shorter than the wing, Hook. fil. Icones Plantar. 1512. *Melicope tetrandra*, Roxb. Fl. Ind. II. 257.

Penang, Singapore, Perak.

A much more common plant than the last, with smaller flowers and fruit, and with leaves not only smaller but much more obovate.

3. Melicope, Forst.

Shrubs. *Leaves* opposite (in the Indian species), 1–3-foliolate, pellucid-punctate. *Flowers* small, in axillary cymes or panicles. *Calyx* 4-lobed or 4-partite. *Petals* 4, sessile, spreading, valvate or imbricate. *Disc* large, entire or 8-lobed, or obsolete. *Stamens* 8, inserted at the base of the disk, those opposite the petals shorter, filaments subulate or flattened; anthers oblong or cordate. *Ovary* 4-celled, deeply 4-lobed; style basilar, or styles 4, subterminal, more or less combined; stigma capitate, 4-lobed; ovules 2 in each, all collateral or superposed. *Fruit* of 4 free spreading coriaceous cocci, dehiscing on the inner face; endocarp more or less separating from pericarp. *Seeds* oblong, testa black, shining; embryo with large oblong cotyledons and short radicle. Distrib. chiefly Polynesian: species about 15.

1. Melicope Helferi, Hook. fil. Fl. Br. Ind. I, 492. A glabrous

dicœceous shrub: young branches rather stout, striate, sub-quadrangular. *Leaves* 1-foliolate: leaflet coriaceous, obovate-elliptic, very obtuse, narrowed to the base: main nerves about 9 pairs, spreading, inconspicuous; length 4·5 to 6 in., breadth 2 to 3 in; petiole ·75 to 1 in. *Panicles* not much longer than the petioles, few-branched, cymose. *Flowers* ·2 in. in diam. *Calyx-lobes* acute. *Petals* longer than the calyx, lanceolate, acute, puberulous outside, ridged along the midrib on the inner surface inside. Kurz For. Flora Burmah, I, 182.

Andaman Islands; Helfer (Kew. Distrib.) No. 1192.

4. Zanthoxylum, Linn.

Shrubs or trees, often armed with stout prickles. *Leaves* alternate, 3-foliolate or unequally pinnate; leaflets opposite or alternate, entire or crenate, often oblique, punctate. *Flowers* small, in axillary or terminal, peduncled, broad or narrow cymes, white, pink, or greenish, often unisexual. *Calyx* 3–8-fid, rarely 0. *Petals* 3–5, rarely 0, imbricate or induplicate-valvate. *Disc* small or obscure. *Stamens* 3–5, hypogynous or reduced to scales in the ♀. *Ovary* rudimentary in the ♂, in the ♀ of 1–5 oblique, 1-celled carpels; styles sublateral, free or connate above, stigma capitate; ovules 2 in each cell, usually collateral. *Fruit* of 1–5, globose, coriaceous or fleshy, 1-seeded cocci, dehiscing ventrally; endocarp horny, separating or not. *Seed* oblong and compressed, or globose, often hanging out of the carpel, hilum broad, testa bony or crustaceous, blue or black, shining, albumen fleshy; embryo axile, straight or curved; cotyledons flat, radicle very short.—Distrib. About 80 species, all either tropical or subtropical.

Unarmed or very slightly armed: leaves 3-foliolate; cymes axillary and terminal; fruit ·3 in. in diam. ... ... 1. *Z. ovalifolium.*

Armed; leaves pinnate, leaflets 4 to 9 pairs; cymes terminal; fruit ·12 in. in diam. ... 2. *Z. myriacanthum.*

1. Zanthoxylum ovalifolium, Wight Ill. I, 169. A shrub or tree: young branches at first puberulous but speedily glabrous, lenticellate, unarmed, or with a few short straight prickles. *Leaves* 3-foliolate: petiole 1·25 to 2·5 in., not armed; leaflets sub-coriaceous, elliptic-oblong, slightly obovate, the apex with an abrupt short obtuse point, the edges crenulate, the base narrowed; both surfaces shining: main nerves 10 to 14 pairs, sub-horizontal, not much more prominent than the intermediate nerves; length 2 to 5 in., breadth 1·2 to 2·5 in.; petiole ·2 to ·4 in., sometimes almost absent; the middle leaflet larger than the two lateral. *Cymes* slender, paniculate, pedunculate, axillary and terminal, shorter than the leaves, with few alternate branches,

puberulous when young, speedily glabrous. *Flowers* 4-to 5-merous, ·12 to ·2 in. in diam., pedicellate. *Petals* valvate. *Fruit* solitary, subglobular, ·3 in. in diam., pitted, glabrous. *Seed* sub-globose. Hook. fil. Fl. Br. Ind. I, 492. *Z. undulatum*, Wall. Cat, 1208. *Z. lucidum*, Wall. Cat. 1212. *Toddalia mitis*, Miq. MSS. *Limonia leptostachya*, Jack MSS. Wall. Cat. (without name) 7472 and 7469.

Singapore: Wallich. Andaman Islands, King's collectors. Distrib.: British India, Sumatra.

2. Zanthoxylum myriacanthum, Wall. Cat. 1214. A glabrous tree 40 feet high, all parts except the petioles armed with short straight prickles. *Leaves* 1 to 1·5 feet long; leaflets 4 to 9 pairs, coriaceous, oblong-lanceolate, acuminate, entire or very obscurely and minutely crenate; main nerves about 8 pairs, spreading, not prominent even when dry; length 3 to 4 in., breadth 1·25 to 1·5 in., petiolule ·1 to ·2 in. *Cymes* terminal, pedunculate, spreading, 6 to 8 in. in diam.; peduncle armed, 5 or 6 in. long; branches long, sub-opposite or alternate. *Flowers* ·2 in. in diam., sub-sessile, 5-merous. *Calyx* with a few small bracts at the base. *Ovaries* 3. *Ripe fruit* compressed, ·12 in. in diam., apiculate. *Seed* compressed. Hook. fil. Fl Br. Ind. I, 496. *Z. longifolium*, Wall. Cat. 7115.

Penang: Porter, Curtis No. 1076. Malacca; Maingay (Kew Distrib.) No. 279.

There are in Scortechini's Herbarium some scraps of a *Zanthoxylum* which appears to be *Z. glandulosum*, Teysm. and Binn.; but without better specimens I hesitate to include that species here.

5. Acronychia, Forst.

Trees, with opposite or alternate, 1-rarely 3-foliolate leaves; leaflets entire. *Flowers* polygamous, small or moderately sized, yellow, in pedunculate, terminal, or axillary corymbs. *Petals* 4, valvate, spreading, revolute. *Stamens* 8, inserted under a thick, 8-angled, tomentose disc; filaments subulate, the alternate longer. *Ovary* inserted in the hollowed apex of the disc, tomentose, 4-celled. *Style* terminal; stigma 4-grooved; ovules 2 in each cell, superposed. *Fruit* a 4-celled drupe, or 4-valved loculicidal capsule. *Seeds* with black testa and copious albumen; embryo straight; cotyledons flat, oblong. Distrib. About 15 species: all tropical Asiatic or Australasian.

Flowers ·35 to ·75 in. in diam., linear in bud,
filaments villous, inflorescence cymose ... 1. *A. laurifolia.*
Flowers ·15 in. in diam., globular in bud,
filaments glabrous, inflorescence racemose ... 2. *A. Porteri.*

1. Acronychia laurifolia, Blume Bijdr. 245. A small tree or

shrub ; young branches puberulous, speedily becoming glabrous. *Leaves* sub-opposite, 1-foliolate ; leaflet thinly coriaceous, oblong, elliptic or sub-obovate, obtusely acuminate or obtuse, the base much narrowed ; both surfaces glabrous, shining, reticulate : main nerves little more prominent than the secondary, 14 to 18 pairs, forming a double series of loops within the edge ; length 2 to 6 in., breadth 1·1 to 2·4 in., petiole ·5 to ·75 in. *Cymes* axillary, slender, long-peduncled, corymbose, the branches opposite, bracts and bracteoles minute. *Flowers* linear in bud, when open ·35 to ·75 in. in diam., pale yellow. *Sepals* small, semi-orbicular, short. *Petals* linear-oblong, obtuse, widening at the base, revolute, more or less villous on the inner surface. *Filaments* villous below. *Ovary* villous, style short, stigma capitate. *Drupe* sub-globular to ovoid, with an angular apiculus, sometimes narrowed at the base and occasionally lobed, 4-angled when dry, from ·25 to ·4 in. long, 3- or 4-celled. Hook. fil. Fl. Br. Ind. I, 498 ; Miq. Fl. Ind. Bat. I, pt. 2, 668 ; Kurz For. Flora Burmah, I, 184. *A pedunculata*, Miq. Fl. Ind. Bat. Suppl. 532 : Ann. Mus. Lugd. Bat. III, 245 ; Thwaites Enum. Pl. Ceyl. 409. *Cyminosma pedunculata* DC. Prod. I., 722 : Thwaites Enum. Pl. Ceyl. 69 : Wall. Cat. 1205. W. & A. Prod. 147 ; Wight Ill. I, 165, t. 65 ; Dalz. & Gibs. Fl. Bombay, Suppl. 17. *C. Ankenda*, Gærtn. Fruct. I, 280, t. 58. *Clausena simplicifolia*, Dalz. in Kew Journ. Bot. III, 180. *Jambolifera pedunculata*, Vahl Symb. III, 52, fig. 61. *Gela lanceolata*, Lour. Fl. Coch. I, 232. *Selas lanceolatum*, Spreng. Syst. II, 216. *Ximenia ? lanceolata*, DC. Prod. I, 533. Wall Cat. *indeterm.* 9028.

In the Andaman and Nicobar Islands. DISTRIB. British India and Ceylon, Malayan Archipelago, Cochin China.

A widely distributed and variable species, of which Sir Joseph Hooker (Fl. Br. Ind. I, 498) recognises six varieties. Of these, however, only two occur in the Malayan Peninsula, the only very well marked form being (6) with flowers 1 in. in diam. and subglobose, fruit nearly 7 in. in diam. ; and (5) with small fruit lobed at the apex.

2. ACRONYCHIA PORTERI, Hook. fil. Fl. Br. Ind. I, 498. A tree 15 to 30 (or even 50) feet high : young branches glabrous, pale. *Leaves* opposite or alternate, 1-foliolate ; leaflet coriaceous, oblong, slightly obovate, usually acute or shortly acuminate, sometimes obtuse, the base much narrowed : both surfaces glabrous dull and opaque : main nerves 8 to 10 pairs, straight, oblique, slightly prominent beneath when dry ; length 3 to 8 in., breadth 1·25 to 3 in., petiole ·5 to ·75 in. *Racemes* often several from one axil, sometimes as long as, but usually shorter than the leaves, slender, puberulous towards the apex, minutely bracteolate. *Flowers* ·15 in. in diam., much shorter than their pedicels, in pairs or sub-verticellate, globose in bud. *Sepals* triangular, acute.

Petals broadly ovate-oblong, pubescent inside. *Filaments* glabrous. *Ovary* glabrescent. *Style* very short; stigma large, ob-pyramidal, 4-lobed. *Drupe* ovoid, tapering to each end, 4-angled when dry, minutely pitted, 4-celled, but often only 2-seeded, ·5 in. long and ·3 in. diam. when dry.

Penang: Porter, Maingay (Kew Distrib.) No. 280, Curtis. Malacca: Griffith. Perak: Scortechini, King's collector.

6. Glycosmis, Correa.

Unarmed shrubs or trees. *Leaves* 1-foliolate or imparipinnate; leaflets alternate. *Flowers* small, in axillary, rarely terminal panicles. *Calyx* 4–5-partite, segments broad, imbricate. *Petals* 4–5, imbricate. *Stamens* 8–10, free, inserted round a disc; filaments subulate, dilated below; anthers small, with often a dorsal or apical gland. *Ovary* 2–5-celled; style very short, persistent, stigma simple, ovules solitary and pendulous in each cell. *Berry* small, dry or fleshy, 1–3-seeded. *Seeds* oblong, testa membranous; cotyledons equal, radicle very short.—Distrib.—Species 5, Asiatic and Australian.

Ovary glabrous: fruit globular	1.	*G. pentaphylla.*
Ovary hairy: fruit oblong, narrowed at the base	2.	*G. sapindoides.*
Ovary rusty-pilose	3.	*G. puberula.*

1. Glycosmis pentaphylla, Corr. in Ann. Mus. VI, 384. A glabrous shrub or small tree. *Leaves* 3- to 5-foliolate, or 1-foliolate, leaflets subcoriaceous, varying from elliptic-lanceolate, lanceolate, oblong, or obovate, or linear-lanceolate to oblong or even obovate; the apex acute, acuminate or obtuse; the edges entire or crenulate; the base narrowed; both surfaces shining; main nerves 4 to 9 pairs, oblique, curving, rather prominent beneath, and depressed above when dry; length 1·5 to 15 in., breadth ·5 to 6 in., petiolule ·1 to ·5 in. *Panicles* cymose, puberulous to glabrous, varying much in size, usually axillary, but often terminal. *Flowers* small. *Ovary* glabrous, 5-celled, rarely 3- to 4-celled: style short, stout. *Berry* globose, white or bluish white, from the size of a pea to that of a cherry. Hook. fil. Fl. Br. Ind I, 499; Kurz For. Burmah, I, 186: Miq Fl. Ind. Bat. I, pt. 2, 522: DC. Prodr. i. 538; W. & A. Prodr. 93; Oliv. in Journ. Linn. Soc. v., Suppl. ii. 37; Wall. Cat. 6374; Thwaites Enum. 45 and 406; Dalz. & Gibs. Bomb. Fl. 29, Bedd. in Trans. Linn. Soc. xxv. 211; Flor. Sylv. Anal. Gen. xliii. t. 6, f. 6. *G. chylocarpa*, W. & A. Prodr. 93. *G. arborea*, DC. l. c.; Wall. Cat. 6373; Thwaites Enum. 45. *G. Retzii*, Roem. Synops. fasc. i. 41. *Sclerostylis pentaphylla*, Bl. Bijdr. 135. *Limonia pentaphylla*, Retz Obs. v. 24; Roxb. Cor. Pl. t. 84; Flor. Ind. ii. 381. *L. arborea*, Roxb. Cor.

Pl. t. 85; Fl. Ind. l.c.; Bot. Mag. t. 2074. *Myxospermum chylocarpum*, Roem. Synops. fasc. i. 40.

In all the Provinces: common. DISTRIB.—Malayan Archipelago, British India, Philippine Islands, Australia.

A very variable and most perplexing species, the Protæan forms of which were first reduced to order by Professor D. Oliver (Journ. Linn. Soc. V, Suppl. II. p. 36). Of the forms recognised by Dr. Oliver only some are found in the Malayan Peninsula and Andaman Islands. Sir Joseph Hooker (in Fl. Br. Ind.) follows Professor Oliver for the most part; and from that book I copy the following account of the varieties. The Calcutta Herbarium is overloaded with specimens of this plant, many of which it is difficult to fit in under any of Professor Oliver's varieties; and for one of these I have ventured to suggest the varietal name *macrorachis*.

VAR. 1: Leaves usually 3-, rarely 1- or 5-foliolate; leaflets 4–9 in., lanceolate or oblong, or obovate-lanceolate, quite entire or obscurely crenulate; panicles towards the tips of the branches usually elongate, many-flowered; ovary usually covered with mamillary glands, 5-celled, connate with the disc at the base.—The commonest form in the Malay Peninsula.—DISTRIB.; British India.

VAR. 2: Leaves usually 3–5-foliolate (except sub-var. 1); leaflets elliptic or elliptic-lanceolate; panicles small, few or many-flowered, flowers smaller; ovary 4–5-celled, scarcely mamillate, constricted at the base and thus free from the disc.—*G. triphylla*, Wight in Hook. Bot. Misc. iii. 298, Suppl. t. 39; Ic. t. 167; W. & A. Prodr. 93. *G. nitida*, W. & A. Prodr. l. c.—The commonest form in the Andaman Islands. DISTRIB.—Western Peninsula, Ceylon, Tenasserim.

Sub-var. 1. *longifolia*: leaves usually 1-foliolate, leaflets 3–10 in., oblong or obovate-lanceolate, often acuminate or even caudate; panicles short, 1–2 in., or if terminal 3–4 in.—Malacca, Assam, the Khasia Mts., Rangoon.

Sub-var. 2. *macrophylla*: Leaves 3–5-foliolate, with the leaflets $3\frac{1}{2}$–6 in., or 1-foliolate with the leaflets 8 to 12 in. long, by 2·5 to 6 in. broad. *G. macrophylla*, Lindl. in Wall. Cat. 6377, Miq. Fl. Ind. Bat. I, pt. 2 p. 522. *Chionotria rigida*, Jack in Mal. Misc. ex. Hook. Comp. Bot. Mag. I, 155. *Ch. monogyna*, Walp. Rep. I, 382. *Sclerostylis macrophylla*, Bl. Bijdr. 135. Penang. DISTRIB.—Assam. Tavoy.

Sub-var 3. *macrorachis*, King, leaflets 1-foliolate, oblong-lanceolate, acuminate, 9 to 15 in. long and 3·5 to 5 in. broad: cymes small, pedicellate, arranged on a raceme 4 to 9 in. long. Penang: Curtis No. 89.

2. GLYCOSMIS SAPINDOIDES, Lindl. in Wall. Cat. 6376. A shrub. *Leaves* 5-to 7-foliolate; leaflets sub-coriaceous, oblong or lanceolate,

acuminate or sub-acuminate, both surfaces glabrous; main nerves 7 to 9 pairs, oblique, faint: length 3 to 8 in., breadth 1 to 3 in., petiole about ·2 in. *Panicles* cymose, sub-pyramidal, axillary and terminal. *Flowers* shortly pedicelled. *Ovary* 2- to 3-celled, hairy, about as long as the thick style. *Berry* oblong, narrowed to the base, usually 1-seeded. Hook. fil. Fl. Br. Ind. I, 501. *G. cyanocarpa*, Spreng. VAR. *sapindoides*, Kurz in Journ. Bot. for 1876, p. 34.

Penang: Wallich, Maingay, Curtis. DISTRIB.—Sumatra, Java, Sikkim.

I doubt very much indeed whether this would not be better treated as a variety of *G. pentaphylla*, than as a species. Except the hairiness and the smaller number of cells usually found in its ovary, and its oblong fruit, I see nothing to distinguish it.

3. GLYCOMIS PUBERULA, Lindl. in Wall. Cat. 6375. A shrub: *leaves* usually 3-foliolate; leaflets sub-coriaceous, ovate to oblong-lanceolate, more or less bluntly acuminate; the base rounded or cuneate, lower surface pale when dry; main nerves about 8 pairs, spreading; length 2·5 to 4·5 in., breadth ·75 to 1·5 in. *Panicles* short, axillary; flowers in short pedicels; disc small, adnate to the 4- to 5-celled oblong rusty-pilose ovary. *Style* very short.

Penang: Singapore, Perak: not common.

Except in its pilose ovary this differs but little from *G. pentaphylla* Corr., of which it would be perhaps well to treat it as a form.

7. MICROMELUM, Blume.

Unarmed trees. *Leaves* imparipinnate; leaflets alternate, oblique. *Flowers* in large terminal corymbose cymes. *Calyx* cupular, 3–5-toothed or lobed. *Petals* 5, free, thick, valvate or subimbricate. *Stamens* 10, free, inserted round a short or long disc; filaments linear-subulate, alternately shorter. *Ovary* 5- rarely 2–6-celled; style constricted at the base, deciduous, stigma obtuse or capitate; ovules 2, superposed in each cell. *Berry* small, dry, usually 1–2-seeded, septa spirally twisted. *Seeds* oblong, testa membranous; cotyledons leafy, crumpled, radicle long.—DISTRIB.—Species 3 or 4: tropical Asiatic and Oceanic.

A large shrub or small tree: fruit glabrous ... 1. *M. pubescens.*

A small shrub, never a tree: fruit pubescent... 2. *M. hirsutum.*

1. MICROMELUM PUBESCENS, Blume Bijdr. 137. A large shrub or small tree; the young parts more or less pubescent or puberulous, the older often glabrescent or even glabrous. *Leaves* 6 to 18 in. long: leaflets 9 to 15, alternate or sub-opposite, membranous, broadly lanceolate to ovate, acuminate, the edges undulate, sub-cuneate or entire; the base cuneate, often very oblique; main nerves 9 to 12

pairs, oblique, not prominent; length 1·5 to 3·5 in., breadth ·5 to 2in. *Cymes* large, terminal, much branched, pedunculate, 4 to 8 in. in diam., many-flowered, minutely bracteolate. *Flowers* ·25 to ·5 in. in diam., on pedicels ·1 to ·2in. long, buds oblong. *Calyx* sub-entire or 5-toothed. *Petals* linear-oblong, sub-acute. *Filaments* alternately longer. *Ovary* mostly pubescent, usually 5-celled. *Berry* ovoid or oblong, ·3 to ·4 in. long, pitted, glabrescent, 1-seeded. Hook. fil. Fl. Br. Ind. I, 501; Kurz For. Flora Burmah I, 186: Oliv. in Journ. Linn. Soc. v. Suppl. ii. 40; Bedd. Flor. Sylv. Anal. Gen. xliii. t. 7, f. 1; Thwaites Enum. 46. *Bergera integerrima*, Roxb. Fl. Ind. ii. 376; Wall. Cat. 6371. *Aurantiacea*, Wall. Cat. 8517, 8518.

In all the Provinces. DISTRIB.—British India, China, the Malayan Archipelago, and Australasia.

2. MICROMELUM HIRSUTUM, Oliver in Journ. Linn. Soc. V. Suppl. II, 40. A shrub, all parts (but especially the inflorescence) more or less tomentose, rarely glabrescent. *Leaves* 6 to 12, rarely 15 in. long; leaflets membranous, 9 to 25, lanceolate or oblong-lanceolate, rarely ovate, shortly acuminate, the edges obscurely serrate, the base often oblique, lower surface softly tomentose; main nerves 5 to 10 pairs, rather prominent beneath: length 1·5 to 3·5 in., breadth ·8 to 1·5 in. *Cymes* terminal, very tomentose, often lax, and 6 to 8 in. in diam., but sometimes condensed and only 2 in. in diam. *Flowers* ·25 in. in diam. *Calyx* deeply 5-lobed, hirsute. *Ovary* villous. *Berry* oblong or obovoid, pubescent, pitted. Hook. fil. Fl. Br. Ind. I, 502; Kurz For. Flora Burmah I, 187: Wall Cat. 8516.

Penang, Singapore, Perak, but not very common. DISTRIB.—British India, Burmah, Philippines.

This is closely allied to *M. pubescens*, but is usually a smaller shrub. The chief differences between the two lie in the greater amount of pubescence in this, and the smaller size of its flowers.

8. MURRAYA, Linn.

Unarmed shrubs or small trees. *Leaves* pinnate; leaflets alternate, petioled, base oblique or cuneate. *Flowers* solitary and axillary, or in terminal corymbs or axillary cymes. *Calyx* 5-fid or partite. *Petals* 5, free, imbricate. Stamens 10, inserted on an elongate disc; filaments subulate, alternately shorter: anthers shortly ovate. *Ovary* 2- to 5-celled, narrowed into the long deciduous style, stigma capitate; ovules solitary, or 2 superposed or collateral in each cell. Berry oblong or ovoid, 1- to 2-celled, 1- to 2-seeded. *Testa of seed* woolly or glabrous; cotyledons fleshy, plano-convex, similar. DISTRIB.—4 species, tropical Asiatic.

1. Murraya exotica, Linn. A glabrous shrub or small tree: young branches terete, the bark pale when dry. *Leaves* 4 to 5 in. long, 3-to 8-foliolate; leaflets thinly coriaceous, shining, ovate or ovate-lanceolate, occasionally rhomboid, more or less obtusely acuminate, the apex often notched, edges entire; the base cuneate, often oblique. *Corymbs* terminal, few-flowered. *Flowers* campanulate. *Sepals* acute. *Petals* oblong-lanceolate, white. *Ovary* 2-celled, style slender, stigma capitate. *Berry* ovoid or sub-globose, shining, red when ripe, ·5 in. long, 2-seeded. Hook fil. Fl. Br. Ind. I, 502; Miq. Fl. Ind. Bat. I, Pt. 2 p. 522; Kurz For. Flora Burmah I, 190; Oliver in Jour. Linn. Soc. V, Suppl. II, 28: Roxb. Fl. Ind. II, 374; Blume Bijdr. 1363; Wall. Cat. 6368; Thwaites Enum. 45; Wight Ic. t. 96; Brandis For. Flora N. India, 48. *M. exotica* and *brevifolia*, Thwaites Enum. 45. *M. paniculata*, Jack in Mal. Misc. I, 31 ex Hook. Bot. Misc. II, 79; DC. Prodr. I, 537; W. & A. Prodr. 94; Dalz. and Gibs. Bomb. Flor. 29. *M. sumatrana*, Roxb. Fl. Ind. II, 375; Wall. Cat. 6369; Miq. Fl. Ind. Bat. l. c. 523. *Chalcas paniculata*, Linn. *Ch. sumatrana*, Roem. Synops. fasc. I, 49. *M. Glenieii*, Thwaites Enum. 406; Oliv. in Journ. Linn. Soc. v. Suppl. II, 29.

Andaman Islands. Malayan Peninsula, Griff. (Kew Distrib.) No. 520. Distrib.—British India, China, Australia. Much cultivated in gardens on account of the fragrance of its flowers.

9. Clausena, Burm.

Unarmed shrubs or trees. *Leaves* imparipinnate, usually deciduous, leaflets membranous. *Flowers* small, in terminal or axillary cymes panicles or lax racemes. *Calyx* 4–5-lobed or-partite. *Petals* 4–5, free, membranous, margins imbricate. *Stamens* 8–10, inserted round an elongated disc, the alternate shorter; filaments usually dilated or arched and concave below the subulate tip; anthers short. *Ovary* stipitate, 4–5- (rarely 2–3-) -celled; style usually distinct, deciduous; stigma obtuse, entire or 2–5-lobed; ovules 2, collateral, or superposed in each cell. *Berry* small, ovoid, oblong or globose, 2–5-celled. *Seeds* oblong, testa membranous; cotyledons equal, plano-convex. Distrib. Species about 14; chiefly tropical Asiatic, with a few African and Australian.

1. Clausena excavata, Burm. Fl. Ind. 87. A shrub or small tree: young branches pubescent or tomentose, as are the young leaves and the inflorescence. *Leaves* 6 to 12 in. long; leaflets 15 to 29, membranous, lanceolate to oblong-lanceolate, acuminate, obscurely crenate; the base narrowed, very oblique; the upper surface when adult glabrescent or glabrous; length 1·5 to 3·4 in., breadth ·5 to 1 in.; petiolule ·1 in.. *Panicle* terminal, pyramidal, its length 4 to 12 in, of which the peduncle forms a third; branches spreading, alternate. *Flowers* ·25

in. in diam., with globose buds, 4-merous; pedicels longer than the flowers. *Calyx* much shorter than the oblong glabrous petals. *Ovary* ovoid, slightly 4-angled, hairy, stipitate; style stout, about as long as the ovary. *Fruit* broadly ovoid, blunt at each end, 1- to 2-seeded. Hook. fil. Fl. Br. Ind. I., 504: Miq. Fl. Ind. Bat. I, pt. 2, p, 524: Kurz For. Flora Burmah I, 188; Blume Bijdr. 139; DC. Prodr. I. 538; Oliv. in Journ. Linn. Soc. v. Suppl. ii. 31. *Murraya Burmanni*, Spreng. Syst. Veg. ii. 315. *Amyris sumatrana* and *punctata*, Roxb. Fl. Ind. ii. 250, 251. *Cookia graveolens*, W. & A. Prodr. 95; Wall. Cat. 8515. *Gallesioa graveolens*, Roem. Synops, fasc. i. 45.

In all the provinces except the Andaman and Nicobar islands. DISTRIB.—British India, Malayan Archipelago, near the bases of hill ranges.

10. TRIPHASIA, Lour.

A spiny shrub. *Leaves* alternate, sessile, 3-foliolate; leaflets obtuse, crenate, the lateral smaller. *Flowers* solitary or in 3-flowered cymes, axillary. *Calyx* 3-lobed. *Petals* 3, free, imbricate. *Stamens* 6, inserted round a fleshy disc; filaments free, subequal, dilated at the base, anthers linear. *Ovary* ovoid, 3-celled, narrowed into a slender deciduous style; stigma obtuse or capitate and 3-lobed; ovules solitary in each cell. *Berry* small, ovoid, 1–3-celled, 1–3 seeded. *Seeds* oblong, immersed in mucilage, testa coriaceous; cotyledons plano-convex, often unequal or lobed.

1. TRIPHASIA TRIFOLIATA, DC. Prod. I, 536. A small glabrous spiny shrub. *Leaflets* coriaceous with obscure nerves, crenulate, dissimilar; the terminal one shortly petiolate, ovate, obtuse, retuse, the base cuneate; the lateral smaller, oblique. *Flowers* about ·5 in. long, white. *Petals* linear-oblong. *Fruit* ovoid, apiculate, glandular-dotted. Hook. fil. Fl. Br. Ind. I, 507; Miq. Fl. Ind. Bat. I. pt. 2. p. 519; Kurz For. Flora Burmah, I, 191: Blume Bijdr 132; Oliv. Journ. Linn. Soc. v. Suppl. ii 26; W. & A. Prodr. 91; Dalz. & Gibs. Bomb. Fl., Suppl. 12. *T. aurantiola*, Lour. Fl. Fl Coch. I, 189; Wall. Cat. 6381. *Limonia trifoliata*, Linn.; Burm. Fl. Ind. t. 35, f. 1.; Bl. Bijdr. 132. *L. diacantha*, DC. Prodr. i. 536.

Nicobar Islands: Kurz. DISTRIB. British India and various tropical countries, but often doubtfully wild. It is possible this may not really be indigenous in the Nicobars, as these islands have for ages been frequented by Malayan pirates, who may have inadvertently introduced it.

11. LUVUNGA, Hamilt.

Glabrous, climbing shrubs, usually armed with axillary (often hooked) spines. *Leaves* 3-foliolate; leaflets coriaceous, quite entire.

Flowers in axillary fascicled or panicled racemes. *Calyx* cupular, entire or obscurely 4–6-lobed. *Petals* 4–5, free, linear-oblong, thick, imbricate. *Stamens* 8 or 10, inserted around a cupular annular or elevated disc; filaments equal or not, linear-subulate, free or cuneate; anthers linear or linear-oblong. *Ovary* 2–4-celled; style stout, deciduous, stigma capitate; ovules 2, superposed in each cell. *Berry* large, ellipsoid, with a thick rind, 2–3-seeded. *Seeds* large, ovoid; testa membranous, nerved; cotyledons equal, oblong, fleshy,—DISTRIB. About 4 species: tropical Asiatic.

Leaflets oblong-lanceolate to oblong-oblanceolate; filaments glabrous, united into a tube ... ... 1 *L. scandens.*

Leaflets elliptic, more or less obovate; filaments free, often woolly ... 2 *L. eleutheranthera.*

1. LUVUNGA SCANDENS, Ham. in Wall. Cat. 6382. A large woody climber. *Leaflets* oblong-lanceolate to oblong-oblanceolate, acute or blunt, the base narrowed, nerves very obscure; length 4 to 12 in., breadth 1 to 2 in., petiolules about ·2 in.; petioles terete, stout, 2 to 5 in. long. *Cymes* many-flowered, short, broad, (1·5 to 2 in. across), on short peduncles. *Flowers* ·5 to ·75 in. long, white. *Calyx-lobes* short, obtuse. *Petals* 4, fleshy, recurved. *Stamens* with glabrous filaments united into a tube (sometimes for three-quarters of their length). *Ovary* 3- to 4-celled. *Berry* of the size of a large olive, yellowish, obscurely 3-lobed, the pericarp smooth. Hook. fil. Fl. Br. Ind. I, 509; Kurz For. Flora Burmah I, 191; Wight Ill. i. 108; Oliv. in Journ. Linn. Soc. v. Suppl. ii. 43; Bot. Mag. t. 4522. Pierre For. Flora Coch. Chine, t. 288. *Limonia scandens*, Roxb. Fl. Ind. ii. 380.

Malacca: Maingay (Kew Distrib.) No. 285. DISTRIB. British India.

2. LUVUNGA ELEUTHERANTHERA, Dalz. in Hook. Kew Journ. Bot. II. 258. A woody climber like the last, the spines usually hooked; leaflets elliptic and usually more or less obovate, shortly and abruptly acuminate; main nerves 8 to 12 pairs, slightly prominent. *Cymes* axillary, many- or few-flowered. *Filaments* free, often woolly in the upper part. *Fruit* as in the last. Hook. fil. Fl. Br. Ind. I. 511; Oliv. in Journ. Linn. Soc. v. Suppl. ii. 44; Dalz. & Gibs. Bomb. Flor. 30. *L. tavoyana*, Lindl. in Wall. Cat. 6383. *L. scandens* and *eleutheranthera*, Thwaites, Enum. 47, 48, 406. *Triphasia sarmentosa*, Blume Bijd. 132; Miq. Fl. Ind. Bat. I. pt. 2, p. 520.

Perak: common. Pahang. Penang.—DISTRIB. Malayan Archipelago, W. Peninsula of British India, Ceylon.

This plant differs from *L. scandens* (to which it is closely allied) in having more obovate leaves, with much more distinct nervation, and

free filaments which are often woolly. It appears to be pretty widely distributed in Java, and is I think without doubt Blume's *Triphasia sarmentosa*.

12. Paramignya, Wight.

Erect or climbing shrubs, unarmed, or with axillary spines. *Leaves* 1-foliolate, the joint often obscure, quite entire, subcoriaceous, persistent. *Flowers* rather large, axillary, solitary or fascicled. *Calyx* cupular or small, and 4–5-lobed. *Petals* 4–5, free, imbricate or rarely induplicate-valvate. *Stamens* 8–10, inserted round a columnar disc; filaments free, linear, equal or subequal, anther linear-oblong. *Ovary* 3–5-celled; style elongate, deciduous; ovules in each cell solitary, or 2 obliquely superposed. *Berry* ovoid or subglobose, often contracted at the base, 1–5-seeded, rind thick. *Seeds* large, oblong, much compressed, testa membranous; cotyledons fleshy, equal.—Distrib.—Species 6; tropical Indian.

Spines short, solitary, axillary, curved, pubescent; flowers ·7 in. long, on slender pedicels longer than themselves ... ... 1 *P. armata.* var. *andamanica.*

Spines long, in pairs, stipular, straight, glabrous; flowers ·35 in. long, on short pedicels ... 2 *P. longispina.*

1. Paramignya armata, Oliver in Journ. Linn. Soc. V. Suppl. II, 43, var. andamanica, King. A scandent shrub; young branches slender, puberulous, speedily becoming glabrous. *Leaflets* elliptic or elliptic-oblong, sub-acute or acute, the base rounded; glabrous except (when young) the upper surface of the midrib near the base; the reticulations and the 10 to 12 pairs of spreading main nerves slightly prominent on the lower surface when dry, the glandular dots also rather prominent; length 4 to 5·5 in., breadth 1·5 to 2·75 in.; petiole ·5 in., pubescent when young especially on the upper surface. *Spines* short, solitary in the axils below the pedicels, slightly curved, pubescent. *Flowers* axillary, in pairs, on slender sparsely pubescent pedicels longer than themselves; pedicels 1·25 to 1·5 in. long, bracteolate at the base. *Calyx* short, deeply divided into 5 broadly obtuse, spreading lobes. *Petals* about five times as long as the calyx, linear-oblong, obtuse, glabrous, ·6 in. long. *Stamens* 10, free, almost as long as the petals: the filaments rather thick and woolly below, slender and glabrous towards the apex; anthers narrowly oblong. *Disc* short, cylindric; not broader than the ovary. *Ovary* ovoid; style elongate, crowned by the discoid stigma, all glabrous. *Fruit* globular or turbinate, smooth, ·5 to ·65 in. in diam.

Andaman Islands: common.

This differs from the typical *P. armata*, Oliver, as it occurs in

Western Peninsular India and in Ceylon, mainly in the size of its leaves, and in its flowers being less numerous in their axils. In its flowers it agrees well with the typical form. It also resembles *P. monophylla*, W. and A.; but the filaments of the stamens of that species are glabrous or nearly so, and taper suddenly to a short point, while the filaments of this are thick and woolly in the lower three-fourths, the upper fourth being filiform and glabrous. The ovary of this is glabrous, of that pubescent; moreover the flowers of this are on long filiform pedicels which arise by pairs from the axils; while in *P. monophylla* the pedicels are short, and are united above the point of origin from the axil. The calyx of *P. monophylla* is besides longer, but much less deeply lobed; it is also pubescent or tomentose, while the calyx of this is glabrous. The disc in this plant is nothing more than a short gynophore.

2. Paramignya longispina, Hook. fil. Fl. Br. Ind. I, 511. A small rigid glabrous tree; branches rather stout, armed with stout straight spines ·75 to 1·5 in. long, and rising from each side of the insertion of the petioles. *Leaves* elliptic-oblong to elliptic, acute or obtuse, the base rounded, nerves indistinct, length 2·5 to 4·5 in., breadth 1·1 to 1·75 in., petiole ·2 in. *Flowers* ·35 in. in diam., axillary, solitary or 2 or 3 together, pedicels short. *Calyx* 5-toothed. *Petals* oblong, obtuse. *Stamens* 10, equal, glabrous; anthers narrow, as long as the filaments, apiculate. *Ovary* glabrous, standing on the disc (gynophore): style stout, cylindric; ovules in pairs. *Fruit* ovoid, much apiculate, 1·25 to 1·75 in. long, glabrous, 3 or 4-celled; the pericarp coriaceous. *Seeds* compressed, beaked. *Atalantia longispina*, Kurz Journ. As. Soc. Bengal, for 1872, pt. 2, p. 295. *Paramignya angulata*, Kurz For. Flora Burmah, I, 194. *Gonocitrus angulatus*, Kurz in Herb. Calc. *Citrus angulata*, Willd.? *Limonia angulata*, W. & A. Prodr. 91; Miq. Fl. Ind. Bat. I, pt. 2. p. 521. Malacca: Maingay (Kew Distrib.) l. c. 286. Perak: Scortechini Distrib.—Burmah.

13. Atalantia, Correa.

Unarmed or spinous shrubs or trees. *Leaves* alternate, 1-foliolate, coriaceous, persistent, quite entire or crenulate; stipule-like scales often present at the base of the petioles and spines, which belong to undeveloped leaf-buds. *Flowers* axillary, rarely terminal, fascicled or or in short racemed corymbs, or panicles, rarely solitary. *Calyx* 3–5-lobed or, partite-rarely irregularly split. *Petals* 3-5, free or adnate to the stamens and united with them into a tube, imbricate. *Stamens* 6–8, rarely 15–20, inserted round an annular or cupular disc, filaments free or irregularly connate, subequal or the alternate shorter; anthers

short, ovate-oblong, or base cordate. *Ovary* 2- or 4-, rarely 3- or 5- celled: style deciduous, stigma capitate; ovules solitary or 2 collateral in each cell. *Berry* large, sub-globose, 1–5-celled, 1–5-seeded, rind thick. *Seeds* oblong; cotyledons fleshy, plano-convex.—DISTRIB.—Species about 10, chiefly tropical Asiatic.

Armed; leaves 1·25 to 2·5 in. long	...	1. *A. monophylla.*
Unarmed; leaves 4 to 6 in. long ...	...	2. *A. Roxburghiana.*

1. ATALANTIA MONOPHYLLA, Correa Ann. du Mus. VI, 383. A large shrub or small tree: the young branches sometimes pubescent at the very tip, usually more or less armed with short, solitary, straight, axillary spines. *Leaves* lanceolate, oblong-ovate, ovate or elliptic; the apex obtuse, often notched, the edges entire, the base slightly cuneate; both surfaces glabrous, the nerves and reticulations rather distinct when dry; length 1·25 to 2·5 in., breadth ·6 to 1·2 in.; petiole ·2 to ·3 in. puberulous. *Flowers* ·35 to ·5 in. in diam., in lax axillary racemes or cymes, the pedicels puberulous, slender, longer than the flowers; buds sub-globose or obovate. *Calyx* irregularly lobed, glabrous, the edges scarious. *Petals* oblong, obtuse, ·3 to ·4 in. long. *Stamens* 8, or fewer; the filaments broad and united into a tube, their apices free and filiform, the anthers ovate. *Ovary* sessile, on a small annular disc. *Berries* ovoid at first, globose when ripe, ·6 to ·8 in. in diam. Hook. fil. Fl. Br. Ind. I, 511: Miq. Fl. Ind. Bat. I, Pt. 2, p. 519; Kurz For. Flora Burmah I, 195: DC. Prod. I, 535; W. and A. Prodr. 91; Wight Ill. I, 108; Wall. Cat. 6353; Oliv. in Journ. Linn. Soc. v. Suppl. II, 24: Dalz. and Gibs. Bomb. Flor. 28. *A. floribunda*, Wight, Ic. t. 1611. *A. platistigma*, Wight Ill. I, 108. *Limonia monophylla*, Linn.; Roxb Cor. Pl. I, t. 82; Fl. Ind. II, 378. *Turræa virens*, Hellen. in Act. Holm. 1788, t. 10, f. I, (not of Linn.). *Trichilia spinosa*, Willd.; DC. Prodr. I, 623. Rheede Hort. Mal. IV, t. 12; Burm. Fl. Zeyl. t. 65, f. I.

Penang, Kedah, Andaman and Nicobar Islands. DISTRIB.—British India, in Sylhet, and in the Peninsula, Ceylon.

The plant named *A. macrophylla* by Kurz (For. Fl. Burmah I, 195), of which there are excellent specimens in the Calcutta Herbarium, seems to be only a luxuriant form of this. I can find no characters in which it differs, except size.

2. ATLANTIA ROXBURGHIANA, Hook. fil. (not of Oliver), Fl. Br. Ind. I, 513. A glabrous shrub or small tree: young branches slender, spineless. *Leaves* thinly coriaceous, elliptic or elliptic-oblong, tapering to each end, the apex sub-acute or shortly acuminate; the base cuneate, rarely rounded; main nerves 10 to 14 pairs, spreading, slightly prominent underneath when dry; length 4 to 6 in., breadth 1·75 to 2·25 in., petiole ·3 in. *Racemes* short, few-flowered, axillary. *Flowers* nearly ·5

in. in diam., buds globose. *Calyx* with 4 obtuse lobes. *Petals* 4, obovate. *Stamens* 8; the anthers oblong-ovoid; filaments free, short, subulate. *Ovary* ovoid, sessile, 2-celled. *Berry* globose when ripe, glabrous, ·6 to ·8 in. in diam. Hook. fil. Fl. Br. Ind. I, 513. *Sclerostylis Roxburghii*, Wight, Ic. t. 72. *Amyris simplicifolia*, Roxb. Fl. Ind, II, 244.

Perak: common. Penang, Malacca; Griffith (Kew Distrib.) No. 537.

There are in the Calcutta Herbarium a large number of fruiting specimens of this from Perak; but not a single one in flower. These specimens agree so entirely with Roxburgh's figure of *Amyris simplicifolia* in the Calcutta Herbarium (of which Wight's Ic. 72 is a copy) and with Griffith's Malacca specimen (No 537), that I have no hesitation in referring them to the same species. The description of the flowers given above is copied from Sir Joseph Hooker's Fl. Br. Ind. I, 513.

Order XXIV. SIMARUBEÆ.

Trees or shrubs, usually with bitter bark. *Leaves* alternate, often large, pinnate or rarely simple; stipules 0 or deciduous. *Inflorescence* axillary, racemose, paniculate or cymose, rarely spicate. *Flowers* usually diclinous, regular, and generally small. *Calyx* 3–5-lobed, valvate or imbricate. *Petals* 3–5, very rarely 0, hypogynous, valvate or imbricate. *Disc* annular or elongate, simple or lobed, rarely 0. *Stamens* as many or twice as many as the petals, rarely indefinite, inserted at the base of the disc; filaments free, often with a scale at the base; anthers oblong, usually introrse, 2-celled, dehiscing longitudinally. *Ovary* free, 1–6-celled, usually deeply lobed, less often entire; styles 2–5, free, or more or less united, stigmas capitate; ovules usually solitary in each cell, rarely more numerous, raphé ventral, micropyle superior. *Fruit* drupaceous, capsular, or occasionally samaroid, usually of 2–6 distinct carpels. *Seeds* usually solitary, erect or pendulous, albuminous; embryo straight or curved, radicle superior.—Distrib. Tropical and subtropical regions of both hemispheres; genera 30; species about 130.

Ovary deeply 4- or 5- lobed; fruit separating into cocci; leaves pinnate.
- Stamens 8 to 10, filaments with dilated ciliate bases ... ... 1. *Harrisonia.*
- Stamens 4.
  - Disc entire: flowers in branching panicles; leaves glabrous ... 2. *Picrasma.*
  - Disc 4-lobed; flowers in small cymes, collected in long narrow panicles; leaves pubescent ... ... 3. *Brucea.*

Stamens 5; disc 5-lobed; flowers in long much-branched panicles; leaves glabrous	4. *Eurycoma.*
Ovary not lobed; fruit not separating into cocci; leaves simple	5. *Irvingia.*

1. HARRISONIA, Brown.

Glabrous spiny shrubs. *Leaves* unequally pinnate or 1-foliolate. *Flowers* hermaphrodite, in bracteate cymes. *Calyx* small, 4–5-fid. *Petals* 4–5, longer than calyx. *Disc* hemispherical. *Stamens* 8–10, dilated at the base. *Ovary* globose or 4–5-lobed, 4–5-celled; styles connate or distinct at the base; ovules solitary, pendulous. *Fruit* a small globose berry. *Seed* solitary, sparingly albuminous.—DISTRIB. Tropics of Old World and of Australia. Species 3–4.

1. HARRISONIA BROWNII, A. Juss. in Mem. Mus. Par. XII, 517, 540, t. 28. A shrub; young branches slender, glabrous, lenticellate, often armed with sharp conical prickles usually in pairs. *Leaflets* 3, ovate to rhomboid, acuminate, coarsely serrate; the terminal one the largest, petiolulate, and much narrowed at the base; the two lateral sessile and slightly narrowed; length from ·6 to 1 in. *Flowers* 1 to 3, when expanded ·3 in. long, tetramerous, from small axillary tubercles on slender pedicels from ·5 to ·75 in. long, buds globose. *Petals* lanceolate, reflexed. *Stamens* 8, erect, as long as the petals; filaments with dilated concave hairy bases, anthers ovate. *Ovary* deeply 4-lobed, 4-celled, glabrous. *Fruit* pisiform, depressed, 3-2- or even 1-celled by abortion, each cell one-seeded; pericarp coriaceous, glabrous. Planch. in Hook. Lond. Journ. Bot. V. 569; Benth. Fl. Austral. I, 376.

S. Andaman: Kurz, King's collectors. DISTRIB.—Timor., N. Australia. Philippines.

2. PICRASMA, Blume.

Trees or shrubs with bitter properties. *Leaves* unequally pinnate. *Flowers* small, declinous or polygamous, in axillary panicles. *Calyx* very small, 4–5 toothed. *Petals* 4–5, valvate, very often increasing after flowering. *Disc* thick, entire. *Stamens* 4–5, not scaly, hairy. *Ovary* 3–5-partite, free; style distinct at the base and apex, but united in the middle, stigmas simple; ovules erect, solitary. *Fruit* of 1–3 fleshy or coriaceous drupes. *Seed* erect, albuminous.—DISTRIB. India, Malay Archipelago, China, Japan, West Indies, Brazil. Species about 4.

1. PICRASMA JAVANICA, Blume, Bijdr, 248. A tree 30 to 60 feet high; young branches glabrous, dark-coloured, rather slender. *Leaflets* 3 to 7, membranous, elliptic-oblong, elliptic-lanceolate or elliptic, more or less

acuminate or caudate-acuminate, the edges entire or (especially in old leaves) thickened and minutely undulate, the base narrowed or rounded; both surfaces glabrous; main nerves 4 to 6 pairs, ascending, curved, rather prominent and pale beneath in adult leaves. *Panicles* axillary, on long peduncles, branching. *Flowers* numerous, crowded at the extremities of the branchlets, 4-merous, ·15 to ·25 in. in diam. *Sepals* broadly ovate, spreading, pubescent, minute. *Petals* much larger than the sepals, ovate, concave, nerved, puberulous. *Stamens* 4; the filaments pubescent in the male, villous in the female flower. *Ovary* deeply 4-lobed, puberulous; the disc entire, woolly. *Style* single; stigmas 4, reflexed. *Fruit* of 1 to 3 sub-globular coriaceous drupes seated on the enlarged disc, and surrounded by the enlarged coriaceous curved petals. Benn. Plantae Javan. Rarior. 197. t. 41; Planch. in Hook. Lond. Journ. Bot. V, 573; Hook. fil. Fl. Br. Ind. I, 520; Kurz for Flor. Burma, I. 201. *P. nepalensis*, Benn. in Wall. Cat. sub No. 8506. (Lith. Cat. p. 287); Pl. Jav. Rar. 201; Planch. in Hook. Journ. Bot. V, 573. *P. andamanica*, Kurz Andam. Rep. App. IV; Hook. fil. Fl. Br. Ind. I, 520; *Brucea?* Wall. Cat. 7499. *B. dubia*, Steud. Nomencl. Wall. Cat. *indeterminata*, No. 9037.

Malacca, Perak, Andamans. Distrib.—Malayan Archipelago, sub-Himalayan tracts, Assam, Khasia Hills and Burmah, in British India.

I can find nothing to distinguish *P. nepalensis* Benn. and *P. andamanica*, Kurz from *P. javanica*, Blume. In fact Kurz himself reduced his species *P. andamanica* to *P. javanica;* and in his latest book (The Flora of British Burmah), he does not give the name *P. andamanica*, which was in fact originally published in a hastily prepared official report. And, as for *P. nepalensis*, Benn.—its author declares in his original description of it, that it differs from *P. javanica*, Bl., only by having sometimes as many as seven leaflets, and in their being more acuminate than is usual in specimens from Java.

3. Brucea, Mill.

Bitter trees or shrubs. *Leaves* large, unequally pinnate. *Flowers* in minute, numerous, very small cymes, collected into long narrow axillary panicles. *Calyx* minute, 4-partite, imbricate. *Petals* 4, minute, linear, imbricate. *Disc* 4-lobed. *Stamens* 4, inserted beneath the disc, filaments naked. *Ovary* 4-lobed, or consisting of 4 entirely free carpels. *Drupes* 4, entirely free, ovoid, somewhat fleshy. *Seed* solitary, exalbuminous.—Distrib. Tropics of Old World and of Australia. Species 6.

1. Brucea sumatrana, Roxb. Fl. Ind. I., 449. A shrub 4 to 6 feet high; young branches rather stout, tawny-pubescent. *Leaflets* about

9, membranous, lanceolate, acuminate, very coarsely dentate-serrate; the base oblique, acute, or obtuse; both surfaces, but especially the lower, softly yellowish-pubescent, 1·5 to 3·5 in. long (the whole leaf from 10 to 14 in. long), petiolule ·15 to ·25 in. long. *Panicles* often as long as the leaves, very narrow. *Flowers* minute, purple, in short distant cymules; the sepals smaller than the petals, both pubescent. *Stamens* about as long as the petals, the filaments short. *Drupes* black when ripe, oval, glabrous, ·15 to ·2 in. long. DC. Prod. II, 88; Wall Cat. 8482; Blume Bijdr., 1167; Planch. in Hook. Lond. Journ. Bot. v., 575; Hook. fil. Fl. Br. Ind. I, 523; Kurz For. Flora, Burma, I, 202.

In all the provinces except the Andaman and Nicobar Islands.—DISTRIB. Malayan Archipelago, British India.

4. EURYCOMA, Jack.

Shrubs or small trees, with bitter bark. *Leaves* very large, unequally pinnate, with entire glabrous leaflets. *Flowers* polygamous, in much-branched sub-terminal glandular-hairy panicles. *Calyx* minute, 5-toothed, valvate. *Petals* 5, induplicate-valvate. *Disc* consisting of 5 glands alternating with the stamens. *Stamens* in male and hermaphrodite flowers 5, smaller in the latter; filaments attached to the base of the petals. *Ovary* 5-partite, free; styles 5, connate, stigmas distinct. *Drupes* 3–5, stipitate. *Seed* solitary, pendulous, exalbuminous.—DISTRIB. Malaya, Philippines. Species 2.

Branches 1 in. thick, rusty-pubescent; petals ·25 in. long, thick, pubescent on both surfaces 1. *E. longifolia.*

Branches ·25 in. thick, glabrous, pale; petals ·35 in. long, thin, glabrous inside ... 2. *E. apiculata.*

1. EURYCOMA LONGIFOLIA, Jack Roxb. Fl. Ind. ed. Carey, II, 307. A shrub or small tree; young branches about 1 in. in diam., densely rusty-tomentose, with large cicatrices. *Leaves* 18 to 24 in. long; the leaflets numerous, coriaceous, oblong-lanceolate, acute, entire; the base oblique, cuneate; both surfaces glabrous, the upper shining; length 3 to 4 in., breadth ·75 to 1 in. *Panicles* usually shorter than the leaves, much-branched, many-flowered, clothed (especially in the younger parts) with rufous glandular hairs. *Calyx* much shorter than the corolla, the segments ovate, spreading. *Petals* thick, erect, ovate-lanceolate, purple, pubescent, slightly glandular in the upper half outside, ·25 in. long. *Stamens* longer than the calyx, alternating with 5 rather large bilobed ciliate glands which are large in the male and small in the hermaphrodite. *Fruit* of 1 to 5, stipitate, narrowly ovoid, apiculate, ridged drupes, ·5 in. long and ·25 in. diam.; the pericarp coriaceous, purple, glabrous. DC. Prodr. ii. 86; Wall. Cat. 8522; Planch. in Hook. Lond. Journ.

Bot. v. 584. *E. merguensis*, Planch. l. c.; *E. tavoyana*, Wall. Cat., 8523; Hook. fil. Fl. Br. Ind. I, 521; Kurz For Flora Burmah. I, 202.

In all the provinces except the Andaman and Nicobar islands. Distrib.—Malayan Archipelago, Philippines, Burmah.

2. Eurycoma apiculata, A. W. Bennett in Hook. fil. Fl. Br. Ind. I, 522. A shrub or small tree; young branches about ·25 in. thick, nearly glabrous, rather pale. *Leaves* 12 to 15 in. long; the leaflets numerous, sub-coriaceous, oblong-lanceolate, shortly and rather abruptly acuminate; the base acute, very slightly oblique; both surfaces glabrous, dull; length 2·5 to 5·5 in., breadth 1 to 1·7 in. *Panicles* shorter than the leaves; the lateral branches short, slender, few-flowered, clothed, especially towards the extremities, with short, black glandular hairs. *Calyx* much shorter than the corolla, the segments sub-erect, ovate, acute. *Petals* thin, erect, linear, glabrous inside, glandular outside, ·35 in. long. *Stamens* about as long as the sepals, alternating with very minute entire glands. *Fruit* as in *E. longifolia*.

Penang: Perak, not so common as the last.

This species comes very near *E. longifolia*, Jack., the chief distinction being in the flowers. The branches are also very much thinner than those of *E. longifolia*, and they are glabrous; the panicles have shorter and fewer-flowered branches.

5. IRVINGIA, Hook. f.

Glabrous insipid trees. *Leaves* simple, coriaceous, entire, with deciduous stipules. *Flowers* hermaphrodite, in axillary panicles, ebracteate. *Calyx* small, 4–5-partite, imbricate. *Petals* 4–5, imbricate. *Disc* very large, cushion-shaped. *Stamens* 10, inserted beneath the disc, filaments long, slender. *Ovary* conical, compressed, 2-celled, entire; style simple, terminal; ovules solitary. *Fruit* drupaceous, large, with 1 pendulous exalbuminous seed. Four species—3 Tropical African, and 1 Malayan.

1. Irvingia malayana, Oliver ex Hook. fil. Fl. Br. Ind. I, 522. Young branches glabrous, striate. *Leaves* coriaceous, glabrous, elliptic, acute, entire, the base rounded; main nerves 14 to 16 pairs, spreading, curved, inconspicuous: length 3·5 to 5·5 in., breadth 1·75 to 2·4 in., petiole ·6 to ·7 in. *Panicles* axillary, little-branched, shorter than the leaves. *Flowers* small, hermaphrodite. *Calyx-lobes* ovate, obtuse. *Petals* twice as long as the calyx and equal to the stamens, reflexed after flowering. *Disc* large, bearing the conical ovary in the middle of it. *Fruit* a glabrous compressed drupe, 2 in. long and nearly 1·5 in. in diam.

Malacca; Maingay (Kew Distrib.) No. 468.

Order XXV. OCHNACEÆ.

Glabrous trees or shrubs. *Leaves* alternate, simple, (very rarely pinnate) coriaceous; stipules 2. *Inflorescence* panicled or occasionally umbellate (rarely flowers solitary), bracteate. *Flowers* hermaphrodite, conspicuous. *Sepals* 4–5, free, imbricate, persistent. *Petals* 5, rarely 4 or 10, free, hypogynous, imbricate, longer than the sepals, deciduous. *Disc* enlarged after flowering, occasionally 0. *Stamens* 4, 5, 8, 10, or indefinite, inserted on the disc, filaments persistent; anthers basifixed, sometimes deciduous, dehiscing longitudinally, or often opening by terminal pores. *Ovary* short, 2-celled, or elongate and 1–10-celled; placenta axile or parietal; style simple, subulate, acute, rarely divided at the extremity, stigmas simple, terminal; ovules 1–2 in each cell, or indefinite, ascending or rarely pendulous, raphe ventral, micropyle superior. *Fruit* indehiscent, drupaceous or baccate, compound; each drupe or pyrene 1–4 seeded; or capsular and 1–5-celled with septicidal dehiscence. *Seeds* solitary, few or numerous; albumen fleshy or 0; embryo straight or rarely curved, radicle superior or inferior.—Distrib. Tropical regions of both hemispheres, but chiefly American. Species about 160.

Tribe 1. Ochneæ. *Ovary* 2–10-celled; ovules solitary in each cell. *Seeds* exalbuminous.

Stamens ∞ ; flowers paniculate ... ... 1. *Ochna.*
Stamens 10; flowers paniculate or umbellate 2. *Gomphia.*
Sepals, petals, and stamens 4 ... ... 3. *Tetramerista.*

Tribe 2. Euthemideæ. *Ovary* imperfectly 5-celled; ovules 2 in each cell. *Seeds* albuminous.

Stamens 5; with alternate staminodes ... 4. *Euthemis.*

1. Ochna, Linn.

Glabrous trees or shrubs. *Leaves* alternate, simple, serrate, rarely entire, 2-stipulate. *Flowers* large, yellow, in bracteate panicles or umbels. *Sepals* 5, coloured, persistent. *Petals* 5–10, deciduous. *Disc* thick, lobed. *Stamens* ∞, shorter than the petals, filaments short or elongated; anthers opening longitudinally, deciduous. *Ovary* deeply 3–10-lobed, lobes 1-celled; styles entirely connate or distinct at the apex; ovules solitary in each cell, axile. *Fruit* 3–10 drupes, seated on the broad disc. *Seed* erect, albuminous.—Distrib. Tropical Asia and Africa. Species about 28.

1. Ochna Wallichii, Planch. in Hook. Lond. Journ. Bot. V, 650. A small tree, with elliptic or elliptic-oblong, sub-crenate, sub-serrate or entire, acute leaves, with cuneate or sub-rounded bases; the main nerves sub-horizontal, faint; length 3 to 5·5 in.; breadth 1·5 to 2·5 in.;

petiole ·15 to ·2 in. *Stipules* very minute. *Flowers* 1·5 in. in diam., in short lateral panicles, the pedicels 1 in. or more in length. *Sepals* ovate or lanceolate, usually reflexed in fruit. *Petals* larger than the sepals. *Anthers* linear, deciduous, shorter than the filiform persistent filaments. *Styles* longer than the stamens, cuneate to the apex, or the apices free and spreading. *Drupes* ovoid, about ·5 in. long. Hook. fil. Fl. Br. Ind. (excl. syn. *O. stipulacea*, Colebr. MSS.). *O. nitida*, Wall. Cat. 2894 (not of Thunbg.); Planch. in Hook. Journ. Bot. V, 653; Kurz For. Fl. Burm. I, 205. *O. squarrosa*, Kurz Andaman Report IV (not of Linn.). *O. andamanica*, Kurz Andam. Rep. Ed. II, 33; Journ. As. Soc. Bengal, for 1872, pt. 2, 295; For. Flora Burm. I, 205. *O. obtusata*, DC. Wall. Cat. 2805, B.

Andaman Islands.—Distrib. Burmah.

Kurz distinguished his species *O. andamanica* by the styles being free and spreading at their apices, while the fruiting sepals are reflexed. But I do not find that these two characters are at all constantly associated. In other respects, Kurz's characters of *O. Wallichii*, and *O. andamanica* are identical. *O. stipulacea*, Colebr., reduced to this by Mr. A. W. Bennett, in Fl. Br. Ind., appears to me to be distinct.

2. Gomphia, Schreb.

Glabrous trees or shrubs. *Leaves* alternate, shining, 2-stipulate. *Flowers* yellow, in axillary or terminal racemes or umbels. *Sepals* 5, coloured, persistent. *Petals* 5, imbricate. *Disc* thick, lobed. *Stamens* 10, inserted at the base of the disc, filaments very short, anthers opening by terminal pores. *Ovary* deeply 5–6-lobed, lobes 1-celled; styles connate, stigma simple; ovules solitary in each cell, erect. *Drupes* 5 or fewer, seated on a broad disc, 1-seeded. *Seed* erect, exalbuminous.—Distrib. Chiefly tropical South American: a few in Asia and Africa. Species about 80.

Flowers in diffuse panicles ... ... 1. *G. sumatrana.*
Flowers in corymbs ... ... 2. *G. Hookeri.*

1. Gomphia sumatrana, Jack in Mal. Misc. No. 5, p. 29; Hook. Bot. Misc. II., 77. A tree 22 to 40 feet high; young branches slender, pale. *Leaves* coriaceous, narrowly elliptic-oblong, tapering to each end, the edges serrulate or sub-entire; main nerves numerous, sub-horizontal, very faint, as are the reticulations; intramarginal nerves from base to apex, two or three, rather distinct when dry; length 3·5 to 7 in., breadth 1·15 to 2·25 in., petiole ·15 in. *Panicles* terminal, longer than the leaves, branching. *Flowers* numerous, ·35 in. in diam. *Sepals* narrowly ovate, veined. *Petals* larger than the sepals, broad, retuse and inflexed at the apex. *Anthers* linear, much longer than

the short filaments. *Ovaries* 5 ; styles longer than the stamens, quite connate. *Ripe carpels* obovate or reniform, shining. Hook. fil. Fl. Br. Ind. I, 525 ; Kurz For. Flora Burm. I, 206 ; Miq. Fl. Ind. Bat. I, pt. 2, 675 ; Wall. Cat. 2803. *G. sumatrensis*, Planch. in Hook. Ic. Pl. t. 712, and Hook. Lond. Journ. Bot. VI. 2. *Ochna crocea*, Griff. Not. IV. 463. *E ? pulcherrima*, Wall, Cat. 2518.

In all the provinces except the Nicobar and Andaman Islands : common.—Distrib. Borneo, Sumatra.

This is very near indeed to G. *angustifolia*, Vahl. ; the only differences that I can find between the two being that in this the petals are larger, with more reflexed edges, and the panicles are larger and more diffuse.

2. Gomphia Hookeri, Planch. in Hook. Lond. Journ. Bot. VI, 3. A tree ; young branches dark-coloured. *Leaves* coriaceous, ovate-oblong to oblong-lanceolate, the base narrowed ; main nerves faint, much curved upwards, no continuous intramarginal nerve ; upper surface shining, the lower dull ; length 2·5 to 6 in., breadth 1 to 2 in., petiole 1·5 to ·35 in. *Flowers* ·35 in. in diam., in lateral or terminal, crowded, minutely bracteolate umbels ; the pedicels slender, ·5 to ·7 in. long. *Sepals* lanceolate. *Petals* very deciduous, about as long as the sepals, oblong, obtuse, not narrowed at the base. *Anthers* deciduous, elongate, about as long as the slender persistent filaments. *Ovaries* 5 ; styles much longer than the stamens, quite connate. *Ripe carpels* sub-globular or obovoid, smooth, ·2 in. diam. Hook. fil. Fl. Br. Ind. I, 525.

In all the provinces except the Nicobar and Andaman Islands.

In the flowers of different individuals, the disc varies in thickness, being in some as thick as the ovaries are long, while in others it is comparatively shallow.

Var. *corymbosa ;* flowers in corymbs, which are sometimes compound ; the lengthened rachis of the inflorescence rough from the transverse cicatrices of the fallen bracts ; shrubby.

3. Tetramerista, Miq.

Shrubs or trees. *Leaves* very large, coriaceous, entire. *Flowers* in axillary racemes with large foliaceous bracts. *Sepals* 4, imbricate, persistent. *Petals* 4, persistent. *Stamens* 4, the filaments with dilated bases, the anthers with sutural dehiscence. *Ovary* 4-angled, 4-celled, the style entire. *Fruit* baccate, globose ; the pericarp leathery.—Distrib. Malaya. Species 1 or 2.

1. Tetramerista glabra, Miq., Fl. Ind. Bat. Suppl., 534. A glabrous tree 30 to 50 feet high ; young branches stout, with shining, rather pale bark. *Leaves* narrowly obovate or oblanceolate, sub-sessile,

the apex obtuse; the base much narrowed, minutely sagittate; upper surface shining, the lower dull, chocolate-coloured when dry; main nerves numerous, sub-horizontal; length 5 to 10 in., breadth 1·25 to 2·75 in., petiole under ·1 in. *Flowers* 1 in. in diam., in long-pedunculate axillary umbellate racemes; pedicels about ·5 in. long, each with a sepal-like bract near the flower. *Sepals* coriaceous, oblong, obtuse. *Petals* linear-lanceolate, about as long as the sepals and reflexed like them. *Stamens* elongate, shorter than the reflexed filaments. *Ovary* ovoid, obscurely 4-angled. *Style* single, stigma minute. *Ripe fruit* ovoid-globose, 1·25 to 1·5 in. long, sub-glabrous, the calyx and corolla persistent; the pericarp thick, fleshy. Bennett in Hook. fil. Fl. Br. Ind. I, 526. *Ancistrocladus? sagittatus*, Wall. Cat. 1055.

Singapore; Wallich. Perak: Wray, Scortechini, King's collector. Distrib. Sumatra.

4. Euthemis, Jack.

Glabrous shrubs. *Leaves* alternate, simple, shining, coriaceous, serrulate, with ciliate deciduous stipules. *Flowers* rose or white, in terminal or leaf-opposed racemes or panicles, bracteate. *Sepals* 5, imbricate, persistent or deciduous. *Petals* 5, longer than sepals, imbricate. *Disc* small, conical. *Stamens* 5, inserted at the base of the disc, with alternate staminodes, anthers opening by terminal pores. *Ovary* semi-5-celled, elongate, viscid; style 1, stigma entire; ovules 1–2 in each cell, pendulous. *Fruit* a berry of 5 pyrenes, each 1–2-seeded. *Seeds* pendulous with a fleshy albumen.—Distrib. Species 4; all Malayan.

Leaves spinulose-serrate; fruit white ... 1. *E. leucocarpa.*
Leaves nearly entire; fruit red ... ... 2. *E. minor.*

1. Euthemis leucocarpa, Jack in Mal. Misc. No. V., p. 16. A shrub 2 to 5 feet high: young branches rather stout, pale, glabrous, lenticellate. *Leaves* oblong-lanceolate, tapering to each end, the edge thickened inside the numerous spinulose serrations; main nerves very numerous, curved at first, then sub-horizontal, indistinct; length 3·5 to 8 in., breadth 1·2 to 2 in.; petiole ·5 to 1·5 in., winged. *Flowers* ·6 or ·7 in. in diam, shortly pedicelled, generally in pairs; bracts ovate, acute. *Sepals* ovate, obtuse, ciliate, the two inner rather smaller. *Petals* longer than the sepals, oblong-ovate, obtuse, reflexed. *Anthers* erect, connivent, subsessile, oblong, acuminate at the apex, style filiform; stigma small, simple. *Berry* snow-white, sub-globular, ·2 to ·35 in. in diam., obscurely angled, mesocarp spongy. Roxb. Fl. Ind. (ed. Carey), II, 303; Planchon in Hook. Ic. Plant. t. 711. Bennett in Hook. fil. Fl. Br. Ind. I, 526; Miq. Fl. Ind. Bat. Pt. 2 p. 675.

In all the provinces except the Andaman and Nicobar islands. Distrib. Malayan Archipelago.

2. EUTHEMIS MINOR, Jack in Mal. Misc. No. V, p. 18. A small shrub, similar to the last, but with nearly entire, sub-acute, obscurely-veined leaves, and red fruits. Roxb. Fl. Ind. (ed. Carey), ii, 304; Bennett in Hook. fil. Fl. Br. Ind. I, 526; Miq. Fl. Ind. Bat. I, Pt. 2, p. 675.

Penang and Singapore.—DISTRIB. Malayan Archipelago.

I give Penang and Singapore as localities for this species, on the authority of Hooker's Flora of British India. It is, however, now probably extinct in both; and I have seen no specimens from any locality nearer to them than the island of Bangka. In Jack's time, this plant appears to have been common enough in Singapore. The plant named *Euthemis elegantissima*, by Wallich, although doubtfully placed in this genus by its author, has leaves very like those of *E. leucocarpa;* but the main nerves curve in a very different manner. Wallich never found it in fruit; but in his day plants of it were common in Singapore and the neighbouring small islands. This too appears now to be extinct. The reduction of *E. elegantissima* to *Gomphia sumatrana*, Planch, which was first suggested by Planchon, is in my opinion quite wrong, the leaves of the two being very different.

ORDER XXVI. BURSERACEÆ.

Trees or shrubs, mostly resiniferous. *Leaves* alternate (very rarely opposite), imparipinnate or trifoliolate, stipulate or ex-stipulate. *Inflorescence* racemose or paniculate. *Flowers* regular, small, hermaphrodite or often polygamous. *Calyx* free, 3–6-lobed, imbricate or valvate, often minute. *Petals* 3–6, distinct, rarely connate, imbricate or valvate. *Disc* annular or cupular, or absent, usually conspicuous, free, or adnate to the calyx. *Stamens* as many or twice as many as petals, inserted at the base or margin of the disc, equal or unequal; filaments free or connate at the base, smooth; anthers dorsifixed, rarely innate, 2-locular, dehiscing longitudinally. *Ovary* free, rarely 1-, more often 2–5-celled; style simple, stigma undivided or 2–5-lobed; ovules 2, or rarely 1 in each cell, anatropous, usually pendulous, rarely ascending, micropyle superior, raphe ventral. *Fruit* drupaceous, indehiscent with hard putamen, or separating into 2–5 pyrenes, rarely pseudo-capsular and dehiscent. *Seeds* solitary, usually pendulous, testa membranous, albumen 0; cotyledons usually membranous, contortuplicate, rarely fleshy and plano-convex, radicle superior.—DISTRIB. Tropical regions of both hemispheres; genera 15 to 19. Species about 250.

Calyx, corolla, and stamens 5-merous.

Fruit hard, woody, 3-winged, separating into 3 indehiscent pyrenes ... 1. *Triomma.*

Flowers 3-merous.

Flowers polygamous, dimorphous. Fruit ellipsoid, more or less trigonous, with terminal style; endocarp bony, 1-3-celled, usually 1-seeded	2. *Canarium.*
Fruit obliquely globose, 1-celled, 1-seeded. Calyx keeled, the segments large, connivent	3. *Trigonochlamys.*
Flowers hermaphrodite, homomorphous. Fruit ellipsoid or sub-globose, with the stigmatic scar lateral or basal, more or less compressed on two sides, rounded on the third; endocarp rarely bony or woody, 1-celled, 1-seeded	4 *Santiria.*

1. Triomma, Hook. fil.

A tree. *Leaves* alternate, exstipulate, imparipinnate; the leaflets few, opposite, petiolulate. *Flowers* very small, in terminal panicles, polygamous. *Calyx* 5-fid. *Petals* 5, small, valvate? *Stamens* 10 (?) inserted at the base of the 5-lobed disc. *Ovary* trigonous, 3-celled, style short, ovules 2 in each cell. *Fruit* 3-winged, 3-valved, as much as 2–2½ inches long, containing 3 hard woody separable pyrenes.—Distrib. A solitary species.

1. Triomma malaccensis, Hook. f. in Trans. Linn. Soc. XXIII. 171; leaflets oblique, ovate-lanceolate, acuminate, entire; drupe ovate-caudate, acutely cuspidate, 2·5 in. long by 2 in. broad: Bennett in Hook. fil. Fl. Br. Ind. I, 528. *Arytera? macrocarpa*, Miq. Fl. Ind. Bat. Suppl. 199.

Malacca: Griffith, Maingay.

There is an authentic specimen in the Calcutta Herbarium of Miquel's *Arytera? macrocarpa*, collected by Teysmann in the Lampongs, Eastern Sumatra. There is no doubt whatever of its identity with this.

2. Canarium, Linn.

Reziniferous trees. *Leaves* alternate, imparipinnate, stipulate or exstipulate. *Flowers* bracteate, in terminal or axillary panicles or racemes, dimorphous, polygamous; those with fertile stamens and rudimentary ovaries being smaller, but in larger inflorescences; those with fertile ovary having rudimentary stamens, being larger, but in smaller inflorescences. *Calyx* campanulate, 3-lobed or 3-fid, valvate. *Petals* 3, imbricate below or valvate, usually exceeding the calyx. *Stamens* 6, distinct, inserted on margin or outside of disc, or filaments confluent below and disc absent. *Ovary* 3-celled; ovules 2 in each

cell; style various, or stigma subsessile, capitate. *Drupe* usually ellipsoidal, more or less distinctly trigonous, with a 1–3-celled, 1–3-seeded stone; cotyledons often partite, contortuplicate. DISTRIB. Tropical Asia, chiefly in Malaya. Species probably about 90.

The genera *Santiria* and *Canarium* are not separated from each other by any bold, well-marked distinction. As regards the Indian species of both genera, I find the following characters the most diagnostic :—

CANARIUM.	SANTIRIA.
Calyx cupular or campanulate.	*Calyx* cupular, never campanulate, sometimes quite flat.
Petals longer than broad, slightly narrowed to the base.	*Petals* rotund, with very broad truncate bases.
Disc small, annular, or thin and cupular, or represented only by the tube formed by the united filaments.	*Disc* large, cupular, fleshy, often corrugated.
Filaments dilated at the base and sometimes united into a tube.	*Filaments* dilated at the base, but never united into a tube.
The flowers with fertile anthers (practically the male flowers) smaller than those with fertile ovaries, but in larger inflorescences.	*Flowers* all hermaphrodite and uniform, as are the inflorescences.

In the majority of the species of *Canarium* in which the filaments are united into a tube, I can find no other disc than that tube.

The genus *Trigonochlamys* is also closely allied to *Canarium* and *Santiria*, being distinguished from both by its much larger calyx, depressed-globose ovary, and spherical drupe. In fact the characters of the three genera so overlap each other, that, in my opinion, they must either be kept distinct by characters more or less minute, as Messrs. Bentham and Hooker have done, or united into a single genus. Dr. Engler steers a middle course; he keeps up *Canarium* and *Santiria*, but unites *Trigonochlamys* with the latter, dividing *Santiria* into three sections: (1) *Icicopsis*, with one species (*S. Planchoni*); (2) *Trigonochlamys*, with four species; and (3) *Eu-santiria* with 22 species. The section *Icicopsis* contains one 3-androus plant, which, as it has the dimorphous flowers and inflorescence of *Canarium*, I have transferred to that genus. I admit that the drupes of the plant in question more resemble those of *Santiria* than of *Canarium*: but, in the majority of its characters, it appears to me to agree better with the latter genus. As regards Dr. Engler's section *Trigonochlamys*, it is difficult to see how *Canarium* and *Santiria* are to be kept distinct as genera, if the four

plants which form this section are to be included under *Santiria*; for the flowers of *Trigonochlamys* are really more like those of *Canarium* than of *Santiria*. The separation of *Canarium* from *Santiria* by characters taken from the drupe, in my opinion, fails. The drupe of *Canarium* is defined as 1 inch or more in length, ovoid or oblong-ovoid, never gibbous, boldly trigonous, its sides equal and its endocarp hard thick and strong, 3-to 1-celled, and the scar of the style apical; while that of *Santiria* is usually less than 1 in. long, shortly and obliquely ovoid or sub-globose, often gibbous, the endocarp being thin, coriaceous, sub-ligneous, never bony, 1-celled, and the scar of the style lateral and often approximated to the base. Unfortunately several species from Perak (which in other respects have the *facies* of *Santiria*) have the style-scar quite terminal; while, on the other hand, some species with many of the characters of *Canarium* have drupes of which the endocarp is not more bony than that of several species of *Santiria*. The characters drawn from the flower, which I have given above, do not appear to me to have hitherto had sufficient value attached to them.

By transferring *Santiria Planchoni*, Benn. to *Canarium;* by keeping up *Trigonochlamys* as a genus characterised by its very large calyx, and globose drupe; and by restricting *Santiria* to the plants which form the section *Eu-santiria* of Engler, I venture to think that the study of all the plants concerned will be simplified.

Stamens 3.

Leaves sub-coriaceous with bluntly acuminate apices and 10 to 14 pairs of main nerves, flowers ·1 in. long, drupes ·4 to ·5 in. long ... ... 1. *C. Planchoni.*

Leaves coriaceous, with caudate-acuminate apices and 7 to 9 pairs of main nerves; flowers ·2 in. long; drupes 2 to 2·25 in. long ... ... 2. *C. caudatum.*

Stamens 6.

Filaments united into a tube.

Leaflets glabrous on both surfaces.

Leaflets 5 to 9 with 7 or 8 pairs of nerves; panicles terminal ... 3. *C. parvifolium.*

Leaflets 11 to 17, with 12 to 19 pairs of nerves; panicles axillary ... 4. *C. euphyllum.*

Leaflets more or less hairy.

Leaflets 7 to 9, sparsely pubescent on the lower surface when young, main nerves 10 or 12 pairs; panicles axillary ... ... 5. *C. grandiflorum.*

Leaflets sparsely hispid on both surfaces when young; glabrous, except the hispidulous nerves, when adult; panicles hispidulous ... ... 6. *C. pilosum.*

Leaflets sparsely hispidulous on the upper surface, their under surface and the inflorescence rufous-pubescent or tomentose ... ... 7. *C. hirtellum.*

Leaflets with the midrib tomentose on the upper surface, the whole of the under surface and the panicles rufous-tomentose ... ... 8. *C. rufum.*

Leaflets glabrous on the upper surface, the lower glaucescent, with a few scattered hairs; panicles rusty-tomentose ... ... 9. *C. purpurascens.*

Filaments free.

Leaflets quite glabrous on both surfaces; petals puberulous outside.

Stipules persistent.

Stipules elliptic-oblong, entire ... 10. *C. commune.*

Stipules pectinately lobed ... { 11. *C. coccineo-bracteatum.*

Stipules (if any) deciduous ... 12. *C. Manii.*

Leaflets glabrous or nearly so on both surfaces, petals rusty-pilose or pilose outside ... ... 13. *C. Kadondon.*

Leaflets with the midrib and nerves puberulous on the lower surface.

Leaflets not glaucous beneath, entire; drupe less than 1 in. long ... 14. *C. rubiginosum.*

Leaflets glaucous beneath, at least when young.

Leaflets crenulate or sub-crenulate; drupes 1 in. long ... 15. *C. Kunstleri.*

Leaflets obscurely and minutely crenate or serrate, drupes about 2 in. long ... 16. *C. glaucum.*

Leaflets rusty-tomentose or pubescent on the lower surface, the midrib tomentose on the upper ... ... 17. *C. secundum.*

Of doubtful position.

Male flowers unknown, but probably near *C. parvifolium* ... ... 18. *C. nitidum.*

1. Canarium planchoni, King, A tree, 50 or 60 feet high; young branches glabrous, cinereous. *Leaves* 5 to 10 in. long, stipules deciduous. *Leaflets* 7 to 13, thinly coriaceous, oblong-lanceolate or elliptic-oblong, shortly and bluntly acuminate; the base rounded, slightly oblique; both surfaces glabrous, the upper pale when dry and the nervation obsolete, the lower brown with the 10 to 14 pairs of sub-horizontal nerves slightly prominent; length 2 to 4 in., breadth ·9 to 1·5 in.; petiolules ·15 to ·3 in., the terminal one longer. *Panicles* numerous, slender, axillary, much shorter than the leaves, pale puberulous; the branches distant, ascending, the small flowers crowded near their apices. *Flowers* ·1 in. long, with several very minute deciduous bracteoles just beneath the calyx. *Calyx* campanulate, deeply cleft into 3 ovate, triangular lobes, tomentose outside, glabrous inside. *Petals* slightly larger than the sepals, deltoid, with a short subulate inflected apex, sub-concave, less tomentose outside than the sepals, glabrous inside. *Stamens* 3, connivent; the anthers innate, broadly ovate; filaments shorter than the anthers, flat, dilated at the base and inserted on the edge of the large cupular fleshy disc. *Ovary* in the male flowers imperfect: in the female flowers small, ovate, 3-grooved, glabrous; style terminal, short, 3-grooved, as is the stigma. *Fruit* ovoid, slightly gibbous, globular, glabrous; the persistent style slightly lateral, ·4 to 5 in. long. *Santiria Planchoni*, A. W. Benn. in Hook. Fl. Br. Ind. I, 536; Engler in De. Candolle Monegr. Phanerog. IV, 154.

Malacca: Maingay (Kew Distrib.), Nos. 315, 1972; Griffith, Nos. 1152, 1153. Perak: King's collector, No. 5573; Scortechini, No. 2097.

2. Canarium caudatum, King n. sp. A tree 20 to 40 feet high; young shoots pale brown, lenticellate, all parts except the calyx quite glabrous. *Leaves* 8 to 13 in. long, stipules (if any) deciduous. *Leaflets* 5 to 7, coriaceous, oblong to ovate, tapering to both ends, the apex caudate-acuminate, the edges entire and sometimes slightly undulate; both surfaces glabrous, shining, the reticulations distinct on the upper surface, and the 7 to 9 pairs of ascending curving interarching main nerves pale on the lower; length 3 to 6 in., breadth 1·5 in. to 2·25 in., petiolules ·4 to ·5 in., the terminal one 1·2 to 1·6 in. *Male panicles* terminal, narrowly pyramidal, few-branched, shorter than the leaves, the bracteoles (if any) deciduous. *Flowers* few, at the extremities of the branches, ·2 in., long. *Calyx* widely campanulate, the mouth with 3 broad, shallow teeth, minutely pubescent outside, glabrous inside. *Petals* longer than the calyx, imbricate, ovate, acute, the base truncate,

thickened in the middle; the edges thin, both surfaces glabrous. *Stamens* 3; the anthers oblong, shorter than the flattened filaments, the dilated bases of which are attached outside the glabrous fleshy disc from which emerges the oblong tapering rudimentary ovary: style filiform, stigma minute. *Female flowers* not seen. *Ripe drupes* narrowly ellipsoid, slightly clavate, sub-trigonous, 2 to 2·25 in. long and ·6 in. in diam.; persistent calyx small, flat, 3-angled.

Perak: King's collector, Nos. 8554, 10016, 10182, and 10227. Scortechini, No. 454.

This and the next are distinctly separated from all the other hitherto described Malayan species by their triandrous flowers. The leaves and drupes of this are also very characteristic.

3. Canarium parvifolium, A. W. Benn. in Hook. fil. Fl. Br. Ind. I. 536. A tree; young branches slender, dark brown, all parts ultimately glabrous except the flower. *Leaves* 6 to 12 in. long; leaflets 5 to 9, coriaceous, oblong-lanceolate to elliptic, acuminate, entire, the base rounded or slightly narrowed, both surfaces shining; nerves 7 or 8 pairs, spreading, invisible above (even when dry) and very faint below, length 2 to 3·5 in., breadth ·8 to 1·6; petiolules ·1 to ·2 in., the terminal one ·35 to ·65 in.; stipules (if any) deciduous. *Panicles* terminal, slender, the branches few, short, few-flowered, bracteolate. *Flowers* ·2 in. long, slightly longer than the pedicels. *Calyx* campanulate; the mouth truncate, quite entire or faintly 3-toothed. *Petals* much longer than the calyx, imbricate, elliptic, obtuse, concave, puberulous on both surfaces. *Stamens* 6, as long as the petals: anthers oblong, much shorter than the filaments which are subulate, much dilated in the lower third and very slightly united at the base. *Rudimentary ovary* ovoid, tapering into the thin cylindric style, glabrous. *Female flowers* unknown. *Ripe drupe* ellipsoid, trigonous, glabrous, 1·5 to 1·75 in. long, and ·8 in. in diam. Engler in DeCand. Monogr. Phanerog. Vol. IV, 140.

Malacca: Griffith, No. 1068; Maingay, No. 353 (Kew Distribution). Perak: King's collector, Nos. 2618 and 7870.

The bases of the filaments in Griffith's No. 1068 are less dilated than in those of Maingay's No. 353, or in those of King's collector's specimens; but in other respects the characters agree. This species in externals much resembles *C. nitidum*, Benn.

4. Canarium euphyllum, Kurz in Journ. As. Soc. Bengal, 1872, Pt. 2. p. 295. A tree 80 to 90 feet high; young shoots very stout, puberulous. *Leaves* 2 to 3 feet long, the stipules (if any) very deciduous. *Leaflets* 11 to 17, membranous, ovate, ovate-oblong or oblong, opposite, very shortly and abruptly acuminate, the edges glandular-serrulate; the base unequal, rounded or sub-cordate; both surfaces

glabrous, minutely reticulate, the upper shining; main nerves 12 to 19 pairs, spreading, rather straight, interarching very near the edge; length 4 to 10 in., the lower leaflets much the smallest; breadth 2 to 3·5 in., petiolules ·35 to ·6 in. *Panicles* shorter than the leaves, axillary, puberulous or glabrous, their branches only 1 or 2 inches long, few-flowered, sub-corymbose. *Flowers* ·4 in. long. *Calyx* shorter than the petals, tubular, cut for half its length into 3 broad blunt teeth, puberulous on both surfaces. *Petals* oblong, concave and thickened at the apex, minutely tomentose outside. *Stamens* 6, the anthers linear-oblong, shorter than the glabrous filaments which for two-thirds of their length are united into a tube; rudimentary ovary truncate, glabrous, with a few hairs on the top. *Female flowers* not seen. *Ripe drupes* ovoid-ellipsoid, not trigonous, glabrous, 1·75 in. long and ·8 in. in diam., peduncles stout; the persistent calyx 3-angled, woody. Kurz For. Flora Burmah. I, 208. A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 535. Engler in DeCand. Monogr. Phanerog. IV., 123.

South Andaman: Kurz, King's collector. Burmah: in North Arakan, Hildebrand.

The leaflets on the same leaf vary much in size and shape; those towards the base being short and broad, while those towards the apex are oblong. This species is closely allied to *C. bengalense*, Roxb., but its calyx is more deeply toothed; its anthers are shorter and broader; and its leaves although very similar in texture, are longer, have thicker rachises, while the leaflets are serrate and not entire. The young branches of this are moreover nearly twice as thick as those of *C. bengalense*.

5. Canarium grandiflorum, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 533. A tree; young branches stout, pubescent, ultimately glabrous and dark-coloured. *Leaves* 9 to 12 in. long, the rachis glabrous. *Leaflets* thinly coriaceous, 7 to 9, opposite, ovate-lanceolate or elliptic-oblong, acuminate, entire, the base rounded, upper surface glabrous; the lower glabrous or sparsely pubescent, with the 10 to 12 pairs of spreading main nerves prominent; length 3 to 4·5 in., breadth 1·35 to 1·75 in.; petiolules ·2 in. long, the terminal one longer. *Male panicles* little more than half as long as the leaves, puberulous or nearly glabrous, with a few long spreading branches; the flowers few, in distant clusters, shortly pedicelled. *Calyx* shortly campanulate, with 3 broad, blunt teeth, pubescent outside, glabrous inside. *Petals* longer than the calyx, oblong, thick, concave, blunt, pubescent outside, glaberulous inside. *Anthers* linear, longer than the filaments, the latter glabrous, dilated, and forming a short tube, rudimentary ovary hairy. *Female flowers* larger than the male, in axillary racemes, or short panicles with racemose branches; the anthers short, ovate; the filaments as in the male. Ovary broadly ovoid, tapering

into the style and like it rufous-pilose; stigma capitate. *Drupe* narrowly ellipsoid, sub-trigonous, glabrous; stone thick, bony, 1·35 in. long. Engler in DeCand. Monogr. Phanerog. IV., 122.

Malacca: Maingay, (Kew Distrib.), No. 312. Singapore: Hullett No. 516.

This is an imperfectly known species. The only male flowers I have seen of it are those in Mr. Hullett's specimen from Singapore. I have seen no ripe drupes. *Canarium dichotomum*, Miq. (*Pimela dichotoma*, Blume Mus. Lugd. Bat. I, 22) closely resembles this as to leaves. But, as neither Blume nor Miquel describes its flowers, it is impossible to decide whether the likeness goes beyond externals. The specific name of this is unfortunate. The flowers described by the author of it are females, and they are not larger than the female flowers of many other species, while they are much smaller than those, for example, of *C. rufum*, Benn.

6. Canarium pilosum, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 533. A tree 30 to 60 feet high; young branches rufous-pubescent, with strigose hairs intermixed. *Leaves* 12 to 18 in. long. *Leaflets* 3 to 7, thinly coriaceous, opposite, oblong-lanceolate to elliptic, sometimes slightly obovate, shortly and abruptly acuminate, entire or obscurely crenulate; the base cuneate, slightly unequal-sided; both surfaces when young sparsely hispid, when adult almost glabrous except the midrib and 12 or 13 pairs of slightly prominent spreading nerves which are sparsely hispidulous; reticulations distinct beneath; length 4·5 to 5·5 in., breadth 1·5 to 2·5 in.; petiolules ·15 to ·25 in., the terminal one more than 1 in.; stipules in pairs, subulate, hairy. *Male racemes* axillary, about 6 in. long, hispidulous, interrupted. *Flowers* about ·5 in. long, pedicellate, few. *Calyx* much shorter than the corolla, tubular, its mouth nearly entire, minutely tomentose on both surfaces. *Petals* narrowly oblong, thickened and wider upwards, puberulous on both surfaces. *Anthers* linear, about half as long as the filaments which are linear, flattened and united into a tube for about one-third of their length; rudimentary ovary very short, rufous-pilose. *Female flowers* unknown; the fruiting racemes only about 4 in. long, nearly glabrous. *Drupes* narrowly ellipsoid, sub-trigonous, glabrous, 1 in. long, and ·5 in. in diam. (unripe). Engler in DeCandolle, Monogr. Phanerog. IV. 121. Wall. Cat. No. 8100.

Malacca: Maingay (Kew Distrib.) No. 302. Singapore: Wallich. Perak: Scortechini No. 424.

This species is very closely allied to *C. hirtellum*, the chief differences being (1) that the calyx of the male flowers of this is almost entire, while in those of *C. hirtellum*, the calyx is deeply 3-toothed; and (2)

that the leaves of this are when young hispidulous, and when adult nearly glabrous ; while those of *C. hirtellum* are more or less densely pubescent beneath at all stages.

7. Canarium hirtellum A. W. Benn. in Hook. fil. Fl. Br. Ind. I. 534. A tree 40 to 60 feet high : the young branches, rachises and under surfaces of the leaves and the inflorescence more or densely rufous-pubescent or tomentose. *Leaves* 9 to 15 in. long : *leaflets* 5 to 7, the the pairs opposite, coriaceous, elliptic, shortly and rather abruptly acuminate, entire or minutely serrulate, the base rounded or subcuneate ; upper surface shining, reticulate, sparsely hispidulous, the midrib tomentose ; main nerves 11 to 13 pairs, spreading, curving, prominent on the lower, depressed on the upper surface ; length 4 to 7 in., breadth 1·5 to 3 in. ; petiolules ·1 to ·2 in., that of the terminal one ·5 to ·75 in. *Male flowers* in axillary or terminal racemes or panicles much shorter than the leaves. *Flowers* ·4 in. long, on short stout pedicels, mostly crowded near the ends of the branchlets. *Calyx* campanulate, with 3 broad blunt teeth, tomentose on both surfaces but especially on the outer. *Petals* longer than the calyx, oblong, concave, thickened upwards, sericeous outside, glaberulous within. *Anthers* linear, about one-third as long as the glabrous flattened filaments which are united into a tube for half their length ; rudimentary ovary very small, rufous-sericeous. *Female flowers* not much larger than the males, the stamens shorter than the pistil, the free part of the filaments very short, the anthers with pubescent edges. *Ovary* broadly ovoid, densely rufous-sericeous ; the style about as long, sparsely pubescent. *Stigma* capitate, 3-lobed. *Ripe drupe* narrowly ellipsoid, trigonous, glabrous, 1 to 1·25 in. long, and ·4 to ·5 in. in diam. Engler in De Candolle Monog. Phanerog. IV, 121 ; Hooker Icones Plantar. No. 1575. Wall Cat. 8102 and 9047.

Penang ; Wallich, Curtis, Nos. 656, 2251. Selangor : Ridley, No. 1869. Perak : King's collector, Wray ; common.

8. Canarium rufum, A. W. Benn. in Hook. fil. Fl. Br. Ind. Vol. 1, 533. A tree 60 to 100 feet high : young branches, inflorescence, petiolules and under surfaces of the leaves rusty-tomentose. *Leaves* 12 to 15 in. long, the rachises glabrous when adult. *Leaflets* 7 to 11, very coriaceous, opposite, elliptic or broadly oblong, shortly and abruptly acuminate, the edges serrate-dentate to the broad rounded sometimes slightly oblique base ; upper surface glabrous except the tomentose midrib, shining, the lower boldly and minutely reticulate : main nerves 12 to 15 pairs, spreading, very prominent beneath ; length 3 to 6 in., breadth 2 to 2·75 in., the lowest leaflets the smallest ; petiolules ·3 to ·4 in., that of the terminal leaflet 1·25 to 1·5 in. ; stipules not seen. Male

branches terminal, shorter than the leaves, very stout, the lateral branches very short, the flowers in dense bracteate clusters at their apices: bracts numerous, broadly ovate, blunt, concave, tomentose outside. *Calyx* very coriaceous, narrowly campanulate with 3 short blunt teeth, sericeous-tomentose on both surfaces. *Petals* longer than the calyx, oblong, concave, tomentose outside except the glabrous edges, glabrous inside. *Stamens* 6: the anthers linear, slightly longer than the filaments which are much dilated in the lower half and slightly united at the base into a short tube inserted outside the fleshy disc; rudimentary ovary short, broad, glabrous. *Female panicles* shorter than the male, but the flowers at least twice as large (·5 in. long); the petals narrower, the anthers much shorter than in the males and the filaments completely united for one-third of their length into a tube; ovary depressed-globular, tomentose, narrowing into the thick tomentose style: stigma discoid. *Ripe drupe* narrowly ellipsoid, sharply 3-angled, glabrous, the apex rather blunt, 2·5 to nearly 3 in. long, and 1 to 1·3 in. in diam. Engler in De Cand. Monog. Phanerog. IV, 107.

Malacca: Griffith, No. 1143, Maingay, No. 301. Perak: King's collector, Wray, Scortechini; common.

A very distinct species recognizable at once by its very coriaceous many-nerved rusty leaflets, large flowers, and boldly trigonous fruits.

9. Canarium purpurascens, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 532. A tree 50 to 70 feet high: young branches densely rusty-puberulous. *Leaves* 8 to 14 in. long; stipules rotund-cordate, rusty-pubescent. *Leaflets* 7 to 9, coriaceous, oblong to elliptic-oblong, rarely obovate-oblong, entire, or slightly serrate towards the abruptly acuminate apex, the base slightly narrowed, upper surface glabrous shining; the lower glabrous and glaucescent, often with a few scattered hairs: main nerves 10 to 14 pairs, spreading; length 2·5 to 5·5 in., breadth 1 to 2 in; petiolule ·2 to ·25 in., that of the terminal one 1 in. or more. *Male inflorescence*; a racemose panicle often branched, rusty tomentose, 9 to 18 in. long; the ultimate branches few flowered branched cymules. *Bracts* ovate, tomentose, larger than the flower-buds, deciduous; flowers ·25 in. long. *Calyx* tubular, tomentose, with 3 broad shallow teeth. *Petals* broadly oblong, acute, concave, tomentose outside, glabrous inside. *Stamens* 6; the filaments much shorter than the narrowly oblong puberulous anthers, dilated at the base and slightly united so as to form a short tube. Disc none. *Rudimentary ovary* turbinate, glabrous, dark-coloured. *Female flowers* ·5 in. long, in stout few-flowered racemes or panicles only 2 to 4 or 5 in. long; ovary globular-ovoid, pubescent, narrowed into a short thick style: stigma large, capitate, 3-lobed. *Drupe* elliptic-ovoid, rather blunt at each end,

sub-trigonus, glabrous, 2 in. long and 1·15 in. in diam. Engler in De. Cand. Monog. Phan. IV, 115. Canarium, Wall. Cat. 9046.

Malacca: Griffith (Kew Distrib.) No. 1142, Derry. Singapore: Wallich, Ridley. Penang: Curtis, Nos. 803, 862, 959, 2708. Perak: Scortechini, No. 175, King's collector, Nos. 6181, 7885.

10. Canarium commune, Linn. A very tall tree: young branches pale puberulous, or almost glabrous. *Leaflets* 7 to 9, sub-coriaceous, ovate-elliptic, acuminate, entire, the base sub-cuneate, both surfaces glabrous; main nerves 10 to 14 pairs, spreading, rather prominent; length 3 to 5 in., breadth 1·3 to 2 in., petiolules about ·5 in.; stipules persistent, elliptic-oblong, puberulous, veined, about 1 in. long. *Panicles* terminal, lax, spreading, minutely puberulous; the flowers clustered at the apices of the branches, their buds enclosed in rotund, very concave, minutely tomentose bracts. *Calyx* campanulate, broadly 3-lobed. *Petals* 3, ovate-rotund, concave. *Stamens* 6, the filaments shorter than the anthers, free; rudimentary pistil (in the male flower) hairy. *Ovary* (in female flower) oblong-globular, glabrous, the style short and thick; stigma 3-lobed (fide Kœnig). *Fruit* ellipsoidal, sub-trigonous, the stone bony, 1-to 3-celled, 2 in. or more long and 1 to 1·25 in. in diam. Kœnig, Ann. Bot. i. 360, t. 7, f. 2; Roxb. Fl. Ind. iii. 137; Blume Mus. Bot. i. 214; Bijd. 1161; DC. Prodr. ii. 79; W. & A. Prodr. 175; Miq. Fl. Ind. Bat. vol. i. pt. 2, 643; Wall. Cat. 8493. Benn. in Hook. fil. Fl. Br. Ind. I, 531. *Sapindus travancorensis*, Wall. Cat. 8047.

Planted in Penang, Singapore and some of the other provinces, but apparently never wild.

Kœnig in his description, which is a very full one, states that the stipules are "crenate, toothed or sometimes fringed." In all the specimens accepted as *C. commune* which I have seen the stipules are entire, and Rumphius thus figures them. For this has well as for other reasons, I suspect that more than one species is included under the name *C. commune*. L.

11. Canarium coccineo-bracteatum, Kurz in Journ. As. Soc. Bengal for 1872, pt. 2, p. 296. A tree: young branches stout, minutely pale-pubescent. *Leaves* 10 to 18 in. long: stipules rather large, puberulous, pectinately lobed. *Leaflets* 5 to 9, opposite, subcoriaceous, broadly ovate, oblong-ovate to oblong, shortly acuminate, setaceous-serrulate or entire on the same tree; the base oblique, rounded, or sub-cuneate: both surfaces glabrous; main nerves 10 to 12 pairs, slightly prominent beneath; length 3·5 to 7·5, breadth 2 to 3 in.; petiolules ·2 to ·4 in., the terminal one 1·5 in. *Panicles* axillary, shorter than the leaves, deciduously puberulous, their branches rather long and spreading; the flowers crowded towards their apices, rather numerous; bracts longer than the

buds, ovate or oblong-acuminate, tomentose outside, scarlet. *Flowers* ·3 in. long, on pedicels about as long as themselves, sub-globose. *Calyx* campanulate, with three deep broad teeth, tomentose outside, glabrous inside. *Petals* longer then the calyx, valvate, ovate, obtuse, puberulous outside, glaberulous inside. *Stamens* 6; the anthers oblong, about as long as the free flattened glabrous filaments which rise from the edge of the fleshy corrugated disc: rudy. ovary minute. *Female flowers and drupe unknown.* Kurz For. Flora Burmah I, 209; A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 536. Engler in De Cand. Monogr. Phanerog. IV, 149.

South Andaman: Kurz, King's collectors.

12. Canarium Manii, King, n. sp. A tree: young branches slender, pale brown, scurfy-puberulous. *Leaves* 9 to 12 in. long, stipules (if any) deciduous. *Leaflets* 5 to 7, thinly coriaceous, ovate or ovate-rotund, shortly acuminate, entire; the base very broad, rounded or sub-cordate, never narrowed; both surfaces quite glabrous, shining, the reticulations minute: main nerves about 10 pairs, spreading, rather straight, slightly prominent beneath; length 3·25 to 4·5 in., breadth 1·5 to 2·75 in.; petiolules ·2 to ·4 in., the terminal one longer. *Panicles* terminal, slender, shorter than the leaves, minutely pubescent; their branches short (1 in. long), corymbose. *Flowers* ·25 in. long, few; buds globular, each with an oblong, obtuse tomentose bract longer than itself. *Calyx* tomentose, widely campanulate, with 3 broad, shallow teeth. *Petals* slightly longer than the calyx, broadly ovate, sub-acute, minutely pubescent externally, glabrous internally. *Stamens* 6, anthers oblong, shorter than the free glabrous slightly flattened filaments which are inserted outside the glabrous fleshy lobed disc.; ovary none. *Female flowers* unknown. *Ripe drupes* ovoid-ellipsoid, glabrous, not trigonous, 1 to 1·25 in. long and ·6 in. in diam.; the woody persistent calyx flat and 3-angled.

South Andaman Island: Man, King's collectors.

This resembles *C. euphyllum*, Kurz in its fruit, but has very different leaves and panicles: the bracts of the inflorescence in this are moreover brown, not scarlet.

13. Canarium kadondon, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 535. A tree, young branches glabrous. *Leaves* 6 to 12 (rarely 15) in. long; their rachises terete, nearly glabrous, stipules (if any) deciduous. *Leaflets* 7 to 9, elliptic-oblong to elliptic, obtusely acuminate, entire, both surfaces glabrous or nearly so, the base often unequal rounded or sub-cuneate; main nerves 6 to 9 pairs, spreading, incurved, slightly prominent beneath; length 2·5 to 5 in., breadth 1 to 2·25 in; petiolules ·35 to ·5 in., the terminal twice as long. *Panicles* sparsely rusty-

tomentose; the lateral branches short and corymbose, minutely bracteolate. *Flowers* globose in bud, about as long as the pedicels; bracteoles minute, subulate. *Calyx* fleshy, cup-shaped, shortly pilose outside, the mouth with three shallow broad teeth. *Petals* valvate, rotund, densely ferruginous, pilose outside, pubescent inside. *Stamens* 6; the anthers broadly ovate, about as long as the filaments which are dilated at the base, free, and inserted outside the broad fleshy lobed glabrous disc. *Ovary* ovoid, glabrous, stigma (in the bud) sub-sessile. *Ripe drupe* ellipsoid-ovoid, apiculate, not trigonous, glabrous, 1·15 in. long and ·6 in. in diam. Engler in DeCand. Monogr. Phanerog. IV., 138.

Malacca: Maingay (Kew Distrib.) No. 365. Perak: King's collector, many numbers. Penang: Curtis Nos. 495, 1432, 1433, 1434; Hullett, No. 186. Pahang: Ridley No. 2575.

A species distinguishable by its globular buds; its petals densely rufous-pilose externally; and by the long slender petiolules of the leaflets.

14. Canarium rubiginosum, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 534. A tree: young branches and inflorescence minutely tawny-tomentose. *Leaves* 9 to 12 in. long, the rachises glabrous when adult; stipules (if any) deciduous. *Leaflets* 5 to 7, coriaceous, elliptic-oblong, shortly and obtusely acuminate, entire, the base rounded or slightly narrowed; both surfaces glabrous when adult, the lower puberulous along the stout midrib and 10 to 13 pairs of spreading curving main nerves, the reticulations also distinct: length 3·5 to 4·5 in., breadth 1·25 to 2 in.; petiolules ·6 in., the terminal one 1·5 in. *Panicles* of male flowers terminal and axillary, 4 to 10 in. long, the branchlets bearing the flowers at their extremities in condensed many-flowered dichotomous cymes. *Buds* globular, ·1 in long, longer than the stout pedicels. *Calyx* a shallow entire cup. *Petals* deltoid, valvate, concave, much exceeding the calyx, minutely tawny-tomentose outside, glabrescent inside as is the calyx. *Stamens* 6, shorter than the petals, inserted on the outside of the lobed cushion-like fleshy disc; the anthers oblong, about as long as the flat free filaments. *Female flowers* unknown. *Ripe drupe* ellipsoid, nearly 1 in. long, and ·6 in. in diam., obscurely trigonous, glabrous. Engler in DeCandolle Monogr. Phanerog. IV, 136.

Malacca: Maingay (Kew Distrib) No. 309.

15. Canarium Kunstleri, King, *n. sp.* A tree 60 to 70 feet high: young branches rather stout, pale brown, minutely and deciduously scurfy-tomentose. *Leaves* 14 to 20 inches; stipules deeply laciniate, puberulous, persistent. *Leaflets* 7 to 11, sub-coriaceous, oblong to elliptic-oblong, shortly acuminate, the edges crenulate or sub-entire; the base rounded or sub-cuneate, slightly oblique; upper surface glabrous, the lower glaucous (at least when young), puberulous on the

midrib and nerves, minutely scaly; main nerves 12 to 15 pairs, spreading, curving, rather prominent beneath; length 4 to 8 in., breadth 2·25 to 3·25 in.; petiolules ·3 to ·4 in., the terminal one twice as long. *Male panicles* terminal, rusty-puberulous, 10 to 12 in. long, spreading, compound, the flowers crowded on the ultimate branchlets; the pedicels short, tomentose, each with 1 or 2 oblong tomentose brown bracteoles which are longer than the globular buds. *Flowers* ·3 in. long. *Calyx* shorter than the petals, cut nearly to the base into 3 ovate obtuse spreading lobes, tomentose outside, puberulous inside. *Petals* ovate, tapering to each end (sub-rhomboid), the outer surface keeled, tomentose with glabrous edges, the inner glabrous. *Stamens* 6; anthers oblong, shorter than the slightly flattened free filaments which are inserted outside the glabrous corrugated disc; ruddy; ovary minute or 0. *Female panicles* as large as the male, fewer-flowered and the flowers larger, the bracts at the bases of the branches laciniate; *stamens* rudimentary; ovary ovoid, style short, thick, both glabrous, stigma large and faintly 3-lobed. *Ripe drupes* ellipsoid, rather blunt at each end, glabrous, very slightly trigonous, 1 in. long and ·6 in. in diam., the style persistent; the pedicel stout, ·6 to ·8 in. long, bearing several persistent bracteoles.

Perak: King's collector Nos. 7041, 7393 and 7509; Curtis, No. 2710.

The nearest ally of this is *C. denticulatum*, Blume, but that has much shorter filaments and smaller leaves; its fruit is unknown.

16. Canarium glaucum, Blume Mus. Bot. Lugd. Bat. I, 219. A tree 40 to 60 feet high: young branches rather slender, lenticellate, deciduously rusty-puberulous. *Leaves* 12 to 15 in. long, the rachis at first rusty-puberulous, ultimately glabrous. *Leaflets* 7 to 9, oblong or elliptic, acute or shortly acuminate, the edges obscurely and minutely crenate or serrate or sub-entire; upper surface glabrous, the midrib pubescent; the lower glaucous, rusty-pubescent on the midrib and sometimes on the 10 to 14 pairs of rather prominent spreading main nerves. *Stipules* rotund-reniform, ·4 in. long. *Panicles* terminal, the male as long as, or longer than the leaves, with lax spreading branches which become shorter upwards. *Male flowers* ·2 in. long., in small bracteate clusters at the ends of the branchlets; bracteoles broadly ovate, tomentose outside, deciduous. *Calyx* campanulate with 3 broad shallow blunt teeth. *Petals* longer than the calyx, broadly ovate-oblong, concave, tomentose outside and glabrescent within like the calyx. *Stamens* 6, the filaments shorter than the anthers, free, dilated at the base, attached outside the glabrous disc; rudimentary ovary glabrous. *Panicles of female flowers* shorter than the males, but the flowers two or three times as large. *Ovary* globose and glabrous below, grooved and pubescent upwards and tapering into the style.

Stigma large, capitate, 3-grooved. *Ripe drupe* ellipsoidal, tapering to the top, glabrous and shining, 1·75 to 2·25 in. long and 1 to 1·25 in. in diam., the persistent thickened calyx forming an open sub-entire cup at its base.

Penang: Curtis Nos. 803, 862, 2708. Perak: King's collector, No 7885.

17. Canarium secundum, Benn. in Hook. fil. Fl. Br. Ind. I, 532. A tree 30 to 50 feet high; young branches slender, and like the rachises under surfaces of the leaves and inflorescence rusty-tomentose or pubescent. *Leaves* 12 to 18 inches long; leaflets 7 to 9, thinly coriaceous, oblong, shortly caudate-acuminate, minutely serrate-dentate to sub-entire, the base rounded or slightly cuneate, upper surface glabrous except the minutely tomentose midrib; the lower much reticulate; main nerves 10 to 15 pairs, obscure above, bold beneath, curved, spreading; length 3 to 6 in., breadth 1·6 to 2 in.; petiolules of lateral leaflets only ·2 to ·3 in., those of the terminal one twice as long. *Stipules* reniform, densely tomentose outside, ·35 in. long, and about ·5 in. broad. *Panicles* terminal, rather slender, 10 to 18 in. long, and with lateral branches several inches long at the extremities of which the flowers are crowded in little heads; bracts numerous, more or less ovate or oblong, rusty-tomentose, enveloping the buds. *Flowers* sub-sessile. *Calyx* with 3 broad lobes. *Petals* oblong, sub-acute, concave, rusty-tomentose outside, glabrous within. *Stamens* 6, the narrowly oblong anthers longer than the dilated filaments which are inserted outside the disc. *Disc* adherent to the ovoid glabrous rudimentary ovary. *Female flowers* unknown. *Drupe* elongated-ovoid, sub-trigonous, sub-acute, glabrous, about 2 in. long and 1 in. in diam., the pedicel stout and the persistent calyx 3-angled. Engler in DeCand. Monogr. Phanerog. IV., 116. *Canarium*, Wall. Cat. 9046. ? *C. Bennettii*, Engler in DeCand. l. c. 119.

Singapore: Wallich, Hullett, Ridley No. 1812, King's collector No. 345. Malacca: Griffith No. 1141 and 1145, Maingay, No. 300 (Kew Distrib.). Perak: King's collector, Nos. 4330, 6101, 7610 and 10722; Scortechini, No. 2081.

This is allied to *C. rufum*, A. W. Benn., but its leaflets are thinner and the panicles much longer and more slender, with longer branches; and the drupe is much less distinctly trigonous. Dr. Engler has founded his species *C. Bennettii* on Griffith's specimen No. 1141. But on dissection of the flowers of the single specimen of that number in the Calcutta Herbarium, I cannot find that they differ from those of the same collector's No. 1145 which Engler refers to. *C. secundum*, Bennet and I therefore venture to reduce his species to this. The

filaments are slightly conjoined at the base and appear as if joined into a tube, but they are easily separable.

16. Canarium nitidum, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 532. A tree 30 to 50 feet high; young branches at first puberulous, but speedily glabrous. *Leaves* 7 to 12 in. long, glabrous, the rachis slender and the petiolules rather long. *Leaflets* 7 to 9, coriaceous, shining, oblong, shortly acuminate, quite entire, the base rounded or slightly narrowed; main nerves 7 to 9 pairs, spreading, almost horizontal, very faint; length 3·5 to 6·5 in., breadth 1·2 to 1·8 in.; petiolules ·4 to ·6 in., that of the terminal leaflet 1 to 1·5 in.; stipules deciduous (not seen). *Fruit* in short terminal racemes: the drupes when ripe ovoid, tapering to each end, glabrous, 1·25 to 1·75 in. long, and about 1 in. in diam. Engler in De Cand. Monog. Phaner. IV, 108; Wall Cat. 8546 *in part.*

Singapore: Wallich. Malacca: Griffith 1147; Maingay No. 358, (Kew Distrib). Perak: King's collector, Nos. 4604, 4263, 5658 and 10916.

Male flowers of this are not known. The ripe drupe is much more ovoid than in the majority of the species, and this is the character by which, so far as the material goes (for male flowers of this are unknown) it is most readily distinguished from *C. parvifolium*, Benn. A flowering specimen recently collected in Singapore by Mr. H. M. Ridley (No. 3799) may belong to this. Ripe fruit from the same tree is required to settle the matter.

2. Trigonochlamys, Hook. f.

A tree with pustulate tomentose-pubescent branches. *Leaves* alternate, imparipinnate, with opposite petiolulate leaflets. *Flowers* polygamous. *Calyx* large, keeled, with 3 large connivent valvate segments. *Petals* 3, valvate, about equalling the calyx. *Disc* annular. *Stamens* 6, inserted on the margin of the disc; filaments very short. *Ovary* 3-celled, nearly globose; style straight, short, stigma 3-lobed; ovules 2 in each cell, axile. *Drupe* obliquely globose, 1-celled, 1-seeded.—A single Malayan species.

1. Trigonochlamys Griffithii, Hook. fil. in Trans. Linn. Soc. XXIII, 170, t. XXVII. A tree 50 to 100 feet high: young branches rather slender, sparsely lenticellate, rusty-puberulous. *Leaves* 6 to 12 in. long, their rachises minutely tomentose; leaflets 13 to 15, thinly coriaceous, oblong-lanceolate, acuminate, entire, the base rounded or slightly narrowed: upper surface glabrous except the tomentose midrib, pale when dry; the lower sparsely pubescent, pale brown when dry and the 13 to 15 pairs of sub-horizontal main nerves rather prominent:

length 1·5 to 3 in., breadth ·65 to ·1 in. *Panicles* shorter than the leaves, few-flowered, rusty-tomentose ; branchlets and pedicels with linear-oblong bracts. *Flowers* polygamous, ·35 in. long. *Calyx* large, keeled, with 3 deep broad triangular connivent rusty-tomentose segments. *Petals* narrowly elliptic, slightly exserted, densely pale tomentose with a glabrous spot on the base inside. *Stamens* 6, inserted by short filaments on the edge of a thin hypogynous annular glabrous disc, very small in the pistillate flowers. *Ovary* depressed sub-globular, glabrous, the style basi-lateral; the stigma depressed, capitate, obscurely 3-lobed. *Drupe* obliquely sub-globose, glabrous, about ·5 in. in diam. Bennet in Hook. fil.Fl. Br. Ind. I, 539. *Santiria Griffithii*, Engler in DC. Monog. Phanerog. IV, 155.

Malacca; Griffith, No. 1148 ; Maingay (Kew distrib.) No. 316. Perak; King's collector Nos. 4625, 1828, 8817.

4. Santiria, Blume.

Resiniferous trees. *Leaves* alternate, 3-foliolate or imparipinnate, firm ; leaflets opposite, slightly oblique, entire. *Flowers* in uniformly hermaphrodite, axillary or terminal branched panicles ; the stipules, (if any) fugacious, bracts usually obsolete, bracteoles minute. *Calyx* cupuliform, 3-lobed or 3-fid, valvate. *Petals* 3, valvate or sub-imbricate, broad and truncate at the base, exceeding the calyx. *Disc* annular, fleshy, adnate. *Stamens* 6, distinct, usually inflexed, inserted on the margin or outside of the disc. *Ovary* 3-celled, with 2 ovules in each cell; style short, stigma capitate or 3-lobed. *Drupe* ellipsoidal or sub-globose, more or less laterally compressed on the ventral side, and the scar of the stigma usually lateral or basal, 1-celled, 1-seeded ; the stone crustaceous, rarely woody, *Cotyledons* contortuplicate.—Distrib. Malayan Archipelago. Species probably 35.

Panicles longer than the leaves.

Panicles and leaves glabrous; leaflets 9 to 20 in. long	1. *S. floribunda.*
Panicles hispidulous-pubescent; leaflets sparsely hispidulous on the lower surface 4 to 8 in. long flowers on long slender pedicels	2. *S. laxa.*
Panicles puberulous; leaflets glabrous; leaflets 3 to 9 in. long flowers on short pedicels	3. *S. fasciculata.*

Panicles shorter than the leaves.
Panicles solitary, axillary or terminal, with rather long peduncles.
Branches of the panicles few, lax, slender, very long and bearing the flowers on short distant cymules ... 4. *S. puberula.*
Branches of the panicle numerous, stout, divaricate; the flowers in corymbose cymes towards their apices.
Flowers ·2 to ·25 in. long; ripe fruit more than 1 in. long ... 5. *S. macrocarpa.*
Flowers ·1 in. long or less: ripe fruit ·6 to ·7 in. long.
Flower-buds conical ... 6. *S. lævigata.*
Flower-buds globular ... 7. *S. oblongifolia.*
Panicles sessile, branching from the base, sometimes more than one from a leaf-axil.
Leaflets quite glabrous.
Scar of stigma terminal in the ripe fruit; leaflets narrowly oblong, their main nerves 12 to 14 pairs ... ... 8. *S. longifolia.*
Scar of stigma of ripe fruit approximated to its base.
Leaflets oblong to elliptic-oblong; nerves 10 to 15 pairs ... ... 9. *S. Wrayi.*
Leaflets elliptic-oblong to ovate; nerves about 8 pairs or fewer ... ... 10. *S. apiculata.*
Leaflets more or less hairy beneath.
Leaflets quite glabrous on the upper surface.
Lower surface of leaflets boldly reticulate and rusty-pubescent ... ... 11. *S. costata.*
Lower surface not conspicuously reticulate, rusty-puberulous when young; main nerves about 10 pairs 12. *S. conferta.*

Leaflets glabrescent on the upper surface, the midrib tomentose; lower surface densely rusty-tomentose; main nerves 15 to 20 pairs ... ... 13. *S. multiflora.*

1. Santiria floribunda, King n. sp. A tree 20 to 30 feet high: young branches stout, scurfy, rusty-pubescent. *Leaves* 2 or 3 feet long, the rachises flattened and channelled on the upper surface below the lowest leaflets, auricled at the very base, puberulous at first but speedily glabrous. *Leaflets* 13 to 15 or 17, coriaceous, oblong, shortly acuminate; the base rounded, slightly unequal; glabrous on both surfaces, the midrib alone sometimes puberulous on the lower, reticulations minute; main nerves 20 to 30 pairs, spreading, curving at the tips, interarching but slightly; length 9 to 20 in., breadth 2·35 to 5 in.; petiolules very stout, 5 to 7 in. long. *Panicles* 2 to 3 feet long, slender, much branched, striate, glabrous, bearing numerous scattered horizontal short branchlets ·5 to 1·5 in. long which bear two or three 3- to 5-flowered cymules. *Flowers* 1 in. long; their pedicels longer, unequal, slender, puberulous, with a few subulate bracteoles at the base. *Calyx* flat, 3-angled, glabrescent. *Petals* erect, deltoid, fleshy, concave, keeled along the middle, glabrous outside. *Stamens* 6, the filaments shorter than the oblong anthers, slightly dilated below, inserted on the outer surface of the edge of the thick fleshy cupular disc. *Ovary* small. *Style* short, stout, 3-angled like the stigma. *Ripe drupes* elliptic, apiculate, glabrous, ·8 in. long and ·5 in. in diam; the peduncles slender, ·5 to ·75 in. long; stigmatic scar terminal.

Perak: King's collector, Nos. 7510, 7632 and 10151.

There are in the Calcutta Herbarium flowering specimens of a species closely allied to this; but in the absence of fruit I hesitate to describe it.

2. Santiria laxa, King. A tree 50 to 70 feet high: young branches, rachises of the leaves, and the inflorescence densely clothed with rusty, hispidulous, spreading and mostly deciduous hairs. *Leaves* 14 to 22 in. long, the stipules (if any) deciduous. *Leaflets* 7 to 9, oblong to oblong-elliptic, sometimes slightly obovate, shortly and abruptly acuminate, the edges entire, the base often unequal-sided, cuneate: length 5 to 8 in., breadth 1·75 to 2·5 in., petiolule ·4 or ·5 in.; both surfaces reticulate, the upper glabrous, the lower sparsely hispidulous especially on the midrib and nerves: main nerves 12 to 14 pairs, slightly prominent on the lower surface, spreading, curving, interarching near the edge. *Panicles* usually much longer than the leaves, terminal, their branches short, lax, rather few-flowered, the ultimate branchlets gla-

brous, the larger hispidulous-pubescent. *Flowers* ·3 in. in diam., glabrous, shorter than the slender minutely bracteolate pedicels. *Calyx* with 3 broad, spreading, very blunt teeth, much shorter than the corolla. *Petals* 3, thick, slightly keeled on the back, ovate, obtuse. *Stamens* 6, free, about as long as the petals, inserted on the outer margin of the 6-lobed, glabrous, cushion-like disc; anthers ovate, about as long as the thick rather flattened filaments: rudimentary ovary submerged in the disc, small, sub-cylindric, glabrous as is the thick fluted style; stigma 3-lobed. *Female flowers* unknown. *Ripe drupes* narrowly ellipsoid, trigonous, one side wider and flatter than the other two, glabrous, 1 to 1·4 in. long and ·6 to ·7 in. in diam; stone thin. *Canarium laxum*, A. W. Benn. in Hook. fil. Fl. B2. Ind. I. 535; Engler in DeCand. Monog. Phanerog. IV, 139.

Malacca; Maingay (Kew Distrib.,) No. 366. Perak: King's collector, Nos. 3192 and 3516. Penang: Curtis No. 1431. Pahang; Ridley No. 2451.

The drupes of this have the remains of the stigma terminal, and in this respect they agree technically with the diagnosis of *Canarium*. But they are not equally 3-sided as in that genus, one side being wider and more rounded than the other two. The structure of the flower is not at all that of *Canarium*, and I therefore transfer the species to *Santiria*.

3. Santiria fasciculata, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 539. A tree 40 to 50 feet high: young branches at first rusty-pubescent, becoming glabrous, the bark pale cinereous. *Leaves* 10 to 15 in., the rachis terete, at first puberulous, afterwards glabrescent, slightly flattened on the upper surface near the base. *Leaflets* 5 to 7, membranous, elliptic to elliptic-oblong, more or less caudate-acuminate, the base cuneate, both surfaces glabrous; main nerves 7 or 8 pairs, spreading, much curved, interarching, bold and prominent on the lower, inconspicuous on the upper surface; length 4·5 to 9 in., breadth 2 to 3 in; petiolules ·75 to 1 in., much thickened at each end, the terminal one much longer. *Panicles* slender, puberulous, terminal, as long as or longer than the leaves, with few long, narrow, angular, lax branches bearing at intervals short 6- to 10-flowered cymules. *Flowers* ·05 in. long; the pedicels unequal, tomentose, bracteolate. *Calyx* cupular, hispid-tomentose outside with 3 bold, deltoid, acute teeth. *Petals* imbricate, slightly longer than the calyx, deltoid, glabrescent. *Stamens* 6, filaments about as long as the broadly ovate anthers and inserted outside the edge of the ring-like glabrous disc. *Ovary* ovoid, glabrous. *Ripe drupes* narrowly and obliquely ovoid, flattened on one side, slightly gibbous at the base, glabrous, the scar of the stigma terminal, ·8 in.

long and ·6 in. in diam. Engler in DeCand. Monogr. Phanerog. IV, 164.

Malacca: Maingay (Kew Distrib.) No. 307. Penang; Curtis No. 1544. Perak: King's collector, Nos. 3123, 3319, 3716, 3500, 6610; Scortechini No. 1988.

4. Santiria puberula, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 537. A tree 30 to 50 feet high: young branches slender, pale gray, at first puberulous afterwards glabrous. *Leaves* 8 to 10 in. long, the rachises glabrescent or glabrous, terete, flattened on the upper surface just above the base. *Leaflets* 5 rarely 7, thinly coriaceous, elliptic to oblong, acute or shortly acuminate, the base slightly cuneate; upper surface quite glabrous; the lower minutely puberulous, reticulate, the 9 to 11 pairs of spreading, curving, interarching nerves prominent: length 4 to 6 in., breadth 1·5 to 2·5 in.; petiolules ·4 to ·6 in. long, the terminal one 1 to 1·75 in., all swollen at the upper end. *Panicles* terminal or axillary, shorter than the leaves, minutely tomentose, with a few lax spreading branches bearing rather distant, 5- to 8-flowered, sub-sessile cymules. *Flowers* about ·05 in. long, the pedicels about as long, unequal, stout, tomentose. *Calyx* cupular; with 3, deltoid, acute teeth, tomentose outside. *Petals* valvate, ovate-rotund, concave, with a slight inflected point at the apex, glabrous, much longer than the calyx. *Stamens* 6; filaments longer than the ovate anthers, inserted on the edge of the crenulate fleshy disc: ovary ovoid, glabrous. *Ripe drupes* narrowly ellipsoid, straight on one side, curved on the other, obscurely 3- or 4-angled, glabrous, the scar of the stigma terminal; length ·75 in., diam. ·35 in. Engler in DC. Mon. Phan. IV, 161.

Perak: Wray, No. 3210: King's collector, No. 3438, 3529, 6832.

This comes very near to *S. fasciculata*, A. W. Benn., and I much doubt its being really distinct from that species.

5. Santiria macrocarpa, King n. sp. A glabrous tree, 40 to 70 feet high: young branches with brown lenticellate bark. *Leaves* 5 to 9 in. long, the rachis slightly flattened on the upper surface near the base. *Leaflets* thinly coriaceous, oblong-elliptic to obovate or sub-rotund, very shortly and bluntly apiculate; the base cuneate, rarely rounded; main nerves 7 or 8 pairs, spreading, slightly curved, interarching boldly, slightly depressed on the upper surface (when dry) and sub-prominent on the lower; length 3 to 4·75 in., breadth 2 to 2·75 in.; petiolules ·35 to ·5 in., the terminal one 1 in. or more. *Panicles* axillary, solitary, shorter than the leaves, with distant lateral branchlets ·5 to 1 in. long and bearing at their apices 2- to 6-flowered bracteolate cymules. *Flowers* ·2 to ·25 in. long. *Calyx* thick, deeply cupular or sub-campanulate, with 3 bold triangular lobes, glabrescent. *Petals* twice as long as the calyx, fleshy,

glabrous, broadly oblong, very concave, the apex much thickened and deeply inflexed and the sides partly inflexed to form a kind of hood. *Stamens* 6; the filaments much shorter than the oblong anthers, lanceolate, dilated at the base and inserted outside the quadrate lobes of the thin ring-like disc. *Ovary* ovoid-globose, glabrous, tapering into the short thick style: stigma discoid. *Ripe drupes* obliquely ovoid, flattened on one side, glabrous, 1·25 to 1·5 in. long, and about ·75 in. in diam; peduncle slender, ·5 to 1 in. long, scar of stigma terminal.

Perak: King's collector, Nos. 5304, 5580 and 7298.

6. Santiria laevigata, Blume Mus. Bot. I, 211. A tree 50 to 100 feet high: young branches dark-coloured, lenticellate, glabrous. *Leaves* 9 to 17 in. long, glabrous: the rachises flattened below the lowest leaflet and channelled at the base. *Leaflets* coriaceous, elliptic-oblong to oblong, shortly acuminate; the base usually rounded or sub-cordate, but sometimes narrowed and sub-oblique: both surfaces reticulate, the lower brown when dry: main nerves 11 to 17 pairs, sub-horizontal, slightly prominent on the lower surface; length 4·5 to 9 in, breadth 1·5 to 2·8 in., petiolules about ·5 in. *Panicles* shorter than the leaves, axillary or slightly supra-axillary, solitary, 6 to 8 in. long (including the rather long peduncles), spreading; the branches ascending, puberulous near the apices where the flowers are crowded in conical ebracteolate cymes. *Flowers* less than ·1 in. long, shorter than the pedicels. *Calyx* cupular, the mouth almost entire or waved, minutely tomentose outside. *Petals* deltoid-rotund, the apex inflexed, valvate, glabrous. *Stamens* 6; anthers ovate, about as long as the filaments which are inserted by dilated bases outside the ring-like disc: rudimentary ovary small, ovoid. *Female flowers* not seen. *Ripe drupes* ·6 in. long, glabrous, broadly ovoid, blunt, flattened on one side, the remains of the stigma near the apex of the flattened side, peduncle ·5 in. long. A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 538; Engler in DeCand. Monog. Phanerog. IV, 165. *Canarium laevigatum*, Miq. Fl. Ind. Bat., Vol. I, Pt. 2, p. 648. *Canarium altissimum*, Herb. Korth.

Malacca; Griffith No. 1149, Maingay. Perak; King's collector, Nos. 4438, 5441, 5839, and 7961; Scortechini.—Distrib. Sumatra.

The leaves of this vary a good deal as to the number of the main nerves and as to the shape of the base, some having broad and even sub-cordate while others have cuneate bases.

7. Santiria oblongifolia, Blume in Mus. Bot. Lugd. Bat. I, 211. A tree 50 to 80 feet high: young branches pale, lenticellate, at first scurfy, afterwards glabrous. *Leaves* 12 to 18 in. long; their rachises terete, not winged at the base but slightly flattened, glabrous, the stipules (if any) deciduous. *Leaflets* 7 to 9 in., thinly coriaceous, oblong,

occasionally ovate-oblong or ovate, slightly unequilateral especially at the base; the apex very shortly abruptly and bluntly acuminate, edges entire; base in the oblong forms sub-cuneate, in the ovate forms broad and rounded; upper surfaces glabrous and reticulate, olivaceous when dry; the lower pale brown when dry, very minutely lepidote; main nerves 10 to 13 pairs (in the ovate forms only 7 or 8 pairs), spreading, interarching near the edge; length 4 to 6 in., the ovate forms shorter; breadth 1·75 to 2·25 in.; petiolules ·5 to ·7 in., the terminal one 1·5 in. *Panicles* axillary or terminal, shorter than the leaves, pale scurfy when young, divaricate, cymose, spreading, the flowers crowded near the extremities of the branches, ebracteolate. *Buds* ·1 in. in diam., sub-globular, about as long as the clavate pedicels. *Calyx* campanulate, deeply cut into 3, rotund, deltoid, sub-concave teeth, scurfy outside. *Petals* sub-rotund with a truncate base, slightly concave, longer than the calyx, puberulous outside, glabrous inside. *Stamens* 6. *Anthers* oblong, about as long as the filaments: the latter flattened, narrow, inserted outside the glabrous, thin, fleshy, lobed disc. *Ripe drupes* ovoid, ellipsoid or globose, flattened on one side, oblique, obscurely 3-gonous, glabrous, ·7 in. long, and ·5 in. in diam., the scar of the stigma at the apex of the flattened side. Engler in DeCand. Monog. Phanerog, IV, 162. *Santiria Maingayi*, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 538: Engler l. c. IV, 165. *Canarium oblongifolium*, Miq. Fl. Ind. Bat. I, Pt. 2, p. 645. *Canarium eupteron*, Miq. Fl. Ind. Bat., Vol. I, Pt. 2, p. 648.

Malacca, (Kew Distrib.) No. 310. Perak: a common tree, King's collector.—Distrib. Sumatra, Java, Borneo.

Blume's original description (drawn up from specimens from Java and Sumatra) suits this plant well. An authentic specimen of Miquel's *Canarium eupteron* shows that that species must be reduced here, as must Bennet's *Santiria Maingayi* of which Maingay's specimen No. 310 (Kew Distrib.) is the type. *Canarium sub-repandum*, Miq. is, according to its author, closely allied to *C. eupteron*, Miq. and should probably also be reduced to this.

8. Santiria longifolia, King n. sp. A tree 10 to 20 feet high: young branches very stout, (·5 to ·75 in. in diam.), their bark brown, glabrous, lenticellate. *Leaves* 2 to 3 feet long, glabrous; the rachises stout, flattened below the lowest leaflets, not winged at the bases. *Leaflets* 11 to 15 pairs, narrowly oblong, gradually tapering to the acuminate apex, the base oblique or rounded; main nerves 12 to 14 pairs, spreading, curved, not prominent: length 9 to 11 in., breadth 1·75 to 2·5 in.; petiolules ·65 to 1 in., stout, enlarged at each end. *Flowers* unknown. *Fruiting panicles* much shorter than the leaves, one or two in the axil of a leaf, unequal, only 4 to 7 in. long, glabrous, the branches short.

Ripe drupes ovoid, flattened on one side, the scar of the stigma terminal, glabrous, 1 in. long. and ·65 in. in diam.

Perak: King's collector, Nos. 3594, 6838.

This is so unlike any described species of *Santiria* that, in spite of the absence of flowers on the only specimens I have seen, I have ventured to name it. The small size of the tree and the large size of its leaves make it easy of recognition in the genus.

9. Santiria Wrayi, King n. sp. A tree 20 to 30 feet high: young branches very thick, (·75 to 1 in. in diam.) *Leaves* 12 to 30 in. long; the rachises trigonous, channelled in the lower part and almost winged at the base, puberulous. *Leaflets* 13 to 15, membranous, oblong to elliptic-oblong, very shortly and bluntly acuminate; the base rounded, slightly oblique; upper surface shining, olivaceous when dry, the lower pale brown, both glabrous and reticulate; main nerves 10 to 15 pairs, spreading, curving, slightly prominent beneath, length 6 to 11 in., breadth 2·5 to 4 in.; petiolules thickened at both ends, ·5 to 1 in., the terminal one more than twice as long. *Panicles* 3 or 4 in. long, several densely crowded in the axils of one leaf, ebracteolate, puberulous or glabrescent below, the ultimate branches scurfy rufous-puberulous. *Flowers* ·1 or ·15 in. long, shorter than the pedicels. *Calyx* cupular, the mouth with 3, broad, shallow teeth, glabrous, with a few hairs near the edge. *Petals* valvate, rotund, glabrous, rather fleshy. *Stamens* 6; the anthers ovate, longer than the flattened filaments which are inserted on the outside of the edge of the ring-like, fleshly, glabrous, corrugated disc. *Rudimentary ovary* small, ovoid. *Female flowers* unknown. *Ripe drupes* obliquely ovoid, slightly compressed, blunt at each end, ·6 to ·75 in. long, glabrous, the scar of the stigma approximated to the peduncle, peduncle ·5 in. long.

Perak: Wray, Nos. 1423, 2970; King's collector, No. 3689; Scortechini No. 2095.

Allied to *S. conferta*, but with larger leaves and fruit, much less hairy panicles, and perfectly glabrous leaves.

10. Santiria apiculata, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 537. A tree 20 to 50 feet high: young branches with pale bark, puberulous. *Leaves* 6 to 8 in. long, stipules (if any) deciduous. *Leaflets* membranous, oblong, elliptic-oblong to ovate, more or less bluntly acuminate, the base rounded or cuneate, glabrous on both surfaces and reticulate especially on the lower; main nerves rather irregular, about 8 pairs, ascending, curved, slightly prominent beneath, length 3·5 to 5·5 in., breadth 1·75 to 2·25 in.; petiolules ·4 to ·6 in., the terminal longer. *Panicles* axillary, slender, shorter than the leaves, more or less pyramidal, glabrous, the flowers small and crowded near the puberulous

apices, bracteoles minute. *Flowers* ·1 in. or less in diam., their pedicels twice as long. *Calyx* cupular with 3 broad, shallow, blunt teeth, nearly glabrous. *Petals* rotund, glabrous. *Stamens* 6, inflexed; anthers ovate, about as long as the flattened filaments which are inserted by their slightly dilated bases outside the glabrous fleshy lobed and corrugated disc. *Rudimentary ovary* ovoid, sunk in the disc, pubescent; style very short; stigma 3-lobed, small, terminal. *Female flowers* in panicles like the males, the stamens with broader filaments: ovary broadly ovoid, pubescent, style very short: stigma large, discoid, cupulate, terminal, *Ripe drupes* ovoid-globose, ·5 in. long, glabrous, the scar of the stigma near the base, the pericarp thinly coriaceous. Engler in DeCand. Monogr. Phanerog. IV, 163.

Malacca: Maingay, Nos. 303, 308, 314 (Kew Distrib.) Perak: Scortechini 1701: King's collector;—Distrib.; Sumatra.

The fruit is remarkable for the close approximation of the remains of the stigma to the peduncle. The venation of the leaves is variable: in many specimens the main nerves bifurcate about half way between the midrib and the edge of the leaf, while in others there is no bifurcation at all.

11. Santiria costata, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 537. A tree: young branches with gray bark, rusty-puberulous at first, ultimately glabrous. *Leaves* 6 to 9 in. long: stipules (if any) deciduous; the rachises broadly channelled above in the lower part, but not winged at the base. *Leaflets* coriaceous, oblong-lanceolate to elliptic, shortly and bluntly acuminate, the base acute or rounded: upper surface quite glabrous and shining, the midrib prominent on both surfaces; lower surface boldly reticulate and with a few scattered hairs; the 9 to 11 pairs of main nerves spreading, curving, very prominent, rusty-pubescent; length 3·5 to 4·5 in., breadth 1·25 to 2 in.,; petiolules ·35 to ·5 in., thickened at both ends. *Panicles* solitary, much shorter than the leaves, (only about 3 in. long) few-branched, rusty-tomentose, deciduously bracteolate. *Flowers* ·1 in. long, in small fascicles at the ends of the branchlets; the slender pedicels about as long or longer. *Calyx* cupular, truncate, dentate, glabrescent. *Petals* much longer than the calyx, broadly ovate, blunt, concave, nearly glabrous. *Stamens* 6; the filaments about as long as the anthers, slender and inserted beneath the margin of the outside of the small ring-like disc. *Ripe drupes* narrowly ovoid, slightly flattened on one side, ·75 in. long and ·5 in. in diam., the scar of the stigma apical. Engler in DeCandolle Monogr. Phanerog. IV, 157.

Malacca: Maingay (Kew Distrib.) No. 313. Perak: King's collector, No. 7597.

The short rusty-tomentose panicles, and almost glabrous flowers on slender pedicels distinguish this from *S. fasciculata*, to which it is closely allied. The leaves also give diagnostic marks, those of this species having more nerves and being pubescent beneath.

12. Santiria conferta, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 537. A tree: young shoots rather stout (·35 in. in diam.), rusty-puberulous, afterwards glabrous and striate. *Leaves* 12 to 18 in. long, stipules (if any) deciduous, the rachis rufous-puberulous when young. *Leaflets* coriaceous, 9 to 13, oblong to oblong-lanceolate, gradually tapering to the acuminate apex, the base rounded: upper surface glabrous, shining, minutely reticulate, olivaceous when dry; the lower brown when dry, minutely rusty-puberulous when young; main nerves about 10 pairs, spreading, curving, slightly prominent on the lower surface: length 3·5 to 6 in., breadth 1·6 to 2 in., petiolules ·6 to ·7 in. *Panicles* 3 to 4 in. long, several from an axil and much shorter than the leaves, rufous-pubescent, densely crowded, bracteoles minute; pedicels slightly shorter than the flowers. Flowers ·1 to ·15 in. long. *Calyx* cupular, with 3 shallow broad teeth, rusty-tomentose outside. *Petals* imbricate, rotund, concave, puberulous. *Stamens* 6, inflexed, the anthers ovate, about as long as the flat filaments which are inserted on the edge of the fleshy ring-like disc: *rudimentary ovary* small, glabrous, ovoid. *Female flowers* not seen. *Ripe drupes* obliquely ovoid, dark-coloured, glabrous, rather less than ·5 in. long, the scar of the stigma near the base, pericarp stoutly coriaceous. Engler in De Candolle Monogr. Phanerog. IV, 160.

Malacca: Maingay (Kew Distrib.) No. 306, Griffith No. 1150.

This is readily distinguished by its crowded condensed rufous-tomentose panicles and small glabrous fruit.

13. Santiria multiflora, A. W. Benn. in Hook. fil. Fl. Br. Ind. I, 538. A tree, 60 to 100 feet high: young branches rather stout (·35 to ·5 in. in diam.), densely and minutely rusty-tomentose like the rachises and under surfaces of the leaves and the inflorescence. *Leaves* 9 to 15 in. long; the rachises terete in the upper part, but channelled near the base. *Leaflets* 5 to 7, coriaceous, oblong or elliptic-oblong, tapering slightly to the shortly acuminate apex; the base cuneate or obliquely rounded; upper surface glabrescent except the tomentose midrib and 15 to 20 pairs of sub-horizontal main nerves which are bold and prominent on the lower surface; length 4·5 to 10 in., breadth 2 to 3 in., petiolules ·4 to ·5 in. *Panicles* axillary or terminal, solitary, shorter than the leaves, ebracteolate, (? bracteoles caducous) spreading. *Flowers* crowded at the extremities, 1 in. long, slightly longer than their tomentose pedicels. *Calyx* a shallow cup, the mouth almost entire or with 3 shallow wavy teeth, tomentose outside. *Petals* much longer than the calyx, slightly imbricate, thick, broadly ovate, obtuse, with short slightly inflexed apical appendix, glabrous. *Stamens* 6, the ovate anthers

about as long as the thick flattish filaments which are inserted on the edge of the thick fleshy ring-like disc; *rudimentary ovary* ovoid, minute. *Female flowers* not seen. *Ripe drupes* ovoid-globose, flattened on one side, ·75 in. long, glabrous, the scar of the stigma below the apex of the flattened side. Engler in DeCand. Monogr. Phanerog. IV, 160.

Malacca: Griffith, No. 1151: Maingay (Kew Distrib.) No. 305. Perak: King's collector.

I quite agree with the author of this species that, when better material of *Santiria tomentosa*, Blume (Mus. Lugd. Bat. I, 211), shall be forthcoming, the two will probably be found to be identical.

Materials for a Flora of the Malayan Peninsula.—*By* George King M.B., LL.D., F.R.S., C.I.E., *Superintendent of the Royal Botanic Garden, Calcutta.*

No. 7.

From the Journal, Asiatic Society of Bengal, Vol. LXIV, Part II, *No.* 1, 1895.

In working out the difficult family of *Meliaceæ*, I have had the great advantage of being able to consult a suite of the specimens of Blume and Miquel, which were kindly lent to me, for the purposes of comparison and study, by Drs. Suringar and Boerlage, of the Leiden Herbarium. Many specimens, chiefly of Bornean species, were, through the kindness of its Director, Mr. W. T. Thiselton Dyer, F.R.S., also lent to me from the Kew Herbarium, some of which were enriched by notes by Dr. O. Stapf, a member of the staff of that Institution.

Order XXVII. *Meliaceæ.*

Trees or shrubs. *Leaves* alternate, exstipulate, usually pinnate, rarely simple or bipinnate; leaflets opposite or alternate, usually quite entire and more or less oblique at the base. *Flowers* hermaphrodite or polygamo-dioecious, regular, usually in axillary panicles. *Calyx* 3- 6-lobed, sometimes entire or with free sepals, usually imbricated in bud. *Petals* 3–6, free or rarely connate at the base, sometimes adhering to the lower half of the staminal tube, valvate or imbricated. *Stamens* 3–12, inserted outside the base of the hypogynous disc; filaments connate in a tube or rarely free; anthers erect, usually sessile on the tube, included or exserted, 2-celled, dehiscing longitudinally. *Hypogynous disc* tubular annular or obsolete, free or connate with the ovary. *Ovary* usually free, 2- 5-celled; style single, stigma disciform or capitate; ovules 2, rarely more, collateral or superposed, raphe ventral, micropyle superior. *Fruit* capsular, drupaceous or baccate. *Seeds* exalbuminous or sometimes with fleshy albumen, often enclosed in an aril.—Distrib. About 700 species, mostly tropical.

KEY TO THE GENERA.

Stamens united in a tube.

*Cells of ovary with 1 or 2 ovules in each.

Leaflets serrate; fruit drupaceous ... ... 1. MELIA.

Leaflets entire; fruit baccate or capsular.

Flowers and staminal tube narrow, elongate; style elongate.

Stigmas 5 or 5-toothed; leaves trifoliolate; fruit baccate ... ... 2. SANDORICUM.

Stigmas entire, single; leaves pinnate; fruit capsular or sub-capsular.

Petals in 2 rows; ovary 7- to 9-celled, with 1 ovule in each cell; disk short, inferior to ovary 3. MEGAPHYLLÆA.

Petals in a single row; ovary 2-to 4-celled.

Disk short, annular; ovules solitary in the cells of the ovary ... ... 4. CHISOCHETON.

Disk cylindric, longer than the ovary; ovules 2 in each cell of the ovary ... 5. DYSOXYLUM.

Flowers and staminal tube globose or turbinate, style short or absent.

Anthers included or incurved.

Petals 3; fruit dehiscent or not ... 6. AMOORA.

Petals 5; fruit indehiscent.

Style none ... ... 7. AGLAIA.

Style short, thick ... ... 8. LANSIUM.

Anthers exserted, never incurved, only partially united into a tube (in two species of *Walsura* not united.)

Petals 5; fruit baccate, indehiscent ... 9. WALSURA

Petals 4 or 5; fruit capsular, dehiscent 10. HEYNEA.

**Cells of ovary 2- to 8-ovuled; stigma discoid; fruit capsular; seeds large, fleshy, not winged ... ... 11. CARAPA.

***Cells of ovary with numerous ovules in each; stigma capitate; fruit capsular; seeds thin, winged 12. CHICKRASSIA.

Stamens distinct.

Cells of ovary 8- to 12-ovuled; seeds membranous, winged 13. CEDRELA.

Cells of ovary with 1 or 2 ovules, fruit baccate; seeds not winged ... ... 9. WALSURA.

1. MELIA, Linn.

Trees with pinnate or 2- 3-pinnate leaves, toothed or entire leaflets and panicled axillary flowers; pubescence often stellate-mealy. *Calyx* short, 5-6 lobed, imbricated. *Petals* 5-6, free, spathulate-oblong, patent,

imbricated in bud. *Staminal-tube* cylindrical, dilated at base and apex, 10- or 12-striate and -toothed; anthers 10 or 12, included or partly exserted, short, inserted near apex. *Disk* annular. *Ovary* 3- 6-celled; cells alternate to the sepals when equal in number to them. *Style* slender, nearly as long as the tube, stigma capitate; ovules 2, superposed. *Fruit* drupaceous. *Seeds* with thin fleshy albumen; cotyledons foliaceous. Distrib. About 12 species; Indo-Malayan.

Petals concave, obtuse; ripe drupe 1 to 1·5 in. long ... ... 1. *M. composita.*

Petals flat, sub-acute; ripe drupe ·6 to ·7 in. long ... ... 2. *M. Azedarach.*

1. Melia composita, Willd. Sp. Plant. II. 558. A tall tree; young branches rather stout, at first covered with pale loose stellate pubescence, ultimately smooth and of a dark colour. *Leaves* 1 to 2 feet long, bi- or occasionally tri-pinnate, the leaflets on each pinna 5- to 11, petiolulate, from ovate-lanceolate to ovate-rotund, often oblique at the base, acuminate, serrulate or entire; the main nerves 7 or 8 pairs, sub-horizontal, rather distinct on the lower surface; both surfaces sparsely stellate-pubescent when young, ultimately glabrous. *Panicles* shorter than the leaves, pedunculate, spreading, stellate-hairy, many-flowered. *Flowers* ·3 to ·35 in. long. *Calyx lobes* erect, ovate-lanceolate, stellate-tomentose outside, pubescent or glabrous inside, much shorter than the petals. *Petals* linear-spathulate, concave, pubescent externally, puberulous internally. *Staminal tube* nearly as long as the petals, slightly expanded at the 10-toothed mouth; the teeth bifid, silky-puberulous on both surfaces; anthers exserted, pubescent. *Stigma* 5-toothed. *Drupe* ovoid, 1 to 1·5 in. long, smooth, yellowish. *Seeds* one in each cell, smooth, pointed. W. and A. Prod. I. 117. (excl. syn. *M. superba*, Roxb.); Dalz. and Gibs. Fl. Bomb. 36; Thwaites Enum. Pl. Ceyl. 59; Bedd. Fl. Sylvat. t. 12; Brandis For. Flora 69. *M. dubia*, Hiern (not of Cav.) in Hook. fil. Fl. Br. Ind. I, 545; De Cand. Monog. Phan. I. 453; Trimen Flora Ceylon Vol. 1. 243 (exc. from all the syn. *M. superba*, Roxb.). *M. robusta*, Roxb. Hort. Beng. 33; Fl. Ind. II, 397. *M. australasica*, Adr. Juss. in Mem. Mus. XIX, 257. *M. æthiopica* and *M. Bombolo*, Welw. Apontam. Phyto-Geogr. Prov. Angola, 584 and 561. *M. argentea*, Herb. Ham. ex Wall. Cat. 1254 C.

Malacca: Maingay No. 317 (Kew Dist.), and probably in some of the other provinces. Distrib. Brit. India, Ceylon, Australia, Angola.

This is a widely-spread species, and has received many names. From the synonymy above quoted, I have excluded *M. superba* Roxb., which I believe to be a distinct species, with which the tree named *M. Birmanica* by Kurz (Journ. As. Soc. Bengal, Vol. 43, pt. 2, p. 183;

For. Flora Burm. I, 213) is probably identical. In Roxburgh's original descriptions of *M. superba* and *M. robusta*, he carefully states the differences on which he depends for their separation. These are as follow:—

M. superba.	*M. robusta.*
Leaves bi- tri-pinnate, 2 to 4 feet long.	*Leaves* bi-pinnate, 12 to 18 in. long.
Flowers small, dull white, with an offensive smell.	*Flowers* small, white, inodorous.
Bracts small, lanceolate, caducous.	*Bracts* solitary, filiform and often very long.
Sepals ovate-lanceolate, incurved, mealy.	*Sepals* ovate-oblong.
Staminal tube 10-ribbed, hairy inside, each of the ten teeth of the mouth divided into 3 4 or 5 short subulate segments.	*Staminal tube* with the segments of its mouth minute and filiform.

Specimens of both trees were growing in the Calcutta Garden when Roxburgh described them, the one having been received from Sunda, the other from Malabar. Roxburgh, of whose sagacity and judgment one has a thousand examples, considered them as quite distinct, and it would take a great deal more evidence than has been produced to make me believe that they are conspecific. The Malabar plant (*M. robusta*) is clearly the same as the Ceylon species which has since been identified with *M. composita*, Willd., Sp. Plantar. II 559. I cannot however agree to the view, first put forward by Mr. Hiern, that *M. composita* Willd. should be reduced to *M. dubia*, Cav. Cavanilles describes three species of *Melia*, *viz.*, *M. azedarach*, *azedirachta*, and *dubia*, and he gives figures of the first two, but not of *M. dubia*. He describes flowers of the latter as like those of *M. Azadirachta* in size, the staminal tube as 6-toothed with a possibility of more teeth ("*an pluribus?*"), and the stigma as peltate. Now, as a matter of fact, the flowers of *M. composita* Willd. are in size and other respects like those of *M. Azidarach*, and not like those of *M. Azadirachta*. The mouth of the staminal tube is many-toothed, and the stigma is ovoid, 5-toothed, and not peltate. Cavanilles' description points to a plant belonging to some other genus than *Melia*, whatever the "original specimen" named *M. dubia* in the Herbarium of the University of Rostock may be; and it is on that specimen which the reduction of *M. composita* to *M. dubia* is based. (See Hiern in Hook. fil. Fl. Br. Ind. I, 545.) No authentic specimen of *M. superba* is, so far as I know, in existence (the specimens issued by Wallich, under this name, being really *M. robusta*, Roxb.). In my opinion *M. superba* Roxb., (the Sunda *i.e.*, Malayan) species, cannot on account of its staminal tube (densely villous internally and with numerous minute teeth at the mouth) be in-

cluded, like *M. robusta*, Roxb., under *M. composita*, Willd. For the teeth of the mouth of the staminal tube of the latter are at most bifid, while its inner surface is nearly glabrous. The only specimens of *Melia* known to me which fits Roxburgh's description in these and other respects, were collected in Burma by the late S. Kurz, and were described by him under the name *M. birmanica*, (Journ. As. Soc. Bengal, 1874, ii. 183; For. Flora Burmah, I, 213). And I know of no other specimens of *M. birmanica* than those of Kurz's collecting. Certainly Maingay's No. 317 (Kew Distrib.) is not the same, as I have determined by dissecting flowers of both. *M. composita*, Willd., is not really very distinct from the Japanese *M. Toosedan*, Sieb. and Zucc., which, in turn, is closely allied to *M. Azadirach*. There are, by the way, in the Calcutta Herbarium, specimens from the Khasia Hills, Munipore, the plains of Assam and also from Sumatra, which, as far as I see, cannot be distinguished from Japanese specimens of *M. Toosedan*. If this identification be correct, the geographical area of the latter species will have to be largely extended.

M. Azadirachta, Linn., is not found in the Malayan Provinces even planted. But *M. Azadarach*, Linn., is very common planted. It presents several varieties, some of which have been elevated to the rank of species.

Roxburgh describes a Penang plant which he names *Melia tomentosa*. Of this no specimen is known now to exist. But he left an excellent coloured drawing of it in the Calcutta Herbarium, which shows it to be no *Melia* but a *Chisocheton*. Jack describes (Malayan Miscellanies I, 12) a Penang species which he named *Melia excelsa*. The only specimens known of this are what Wallich issued (under this name) as No. 1253 *b*. of his catalogue. The only Wallichian specimens of this which I have seen are without flowers: they have simple long pinnate leaves, and their *facies* is not that of *Melia* but of some other genus.

2. Melia Azidarach, Linn. Sp. Pl. ed. I., 384. A small tree; young branches rather slender, at first scurfy-puberulous, afterwards dark-coloured and glabrous. *Leaves* 1·5 to 2 feet long, bi-pinnate, glabrous when adult; pinnæ about 3 pairs, the uppermost often 3-foliolate; pinnulæ 5 to 7, opposite or sub-opposite, obliquely ovate or oblong-ovate, acuminate, shortly petiolulate, 1·5 to 2 in. long, when young coarsely serrate, when adult serrulate or sub-entire. *Panicles* shorter than the leaves, shortly pedunculate, spreading, lax, few-flowered, at first stellate-puberulous but ultimately glabrous. *Flowers* ·35 in. long. *Calyx-lobes* oblong-lanceolate, pubescent. *Petals* flat, oblanceolate-spathulate, puberulous. *Staminal tube* lilac, expanding at the 30-toothed mouth, glabrous

outside, sparingly pubescent inside. *Style* clavate at the apex; *stigma* 10-lobed. *Drupe* oblong, smooth yellowish, ·6 or ·7 in. long. Linn. Hort. Cliff. 161; Cav. Diss. 7 t. 393, p. 207; Roxb. Hort. Beng. 33; Fl. Ind. ii. 395; Wight Ic. t. 160; Wall. Cat. 1250; DC. Prod. i, 621, Boiss. Fl. Orient. i. 954; W. & A. Prodr. i. 117; Adr. Juss. in Mém. Mus. xix. t. 13, f. 4; Bot. Mag. t. 1066; Bedd. Fl. Sylvat. t. 13; Brandis For. Flor. 68; Miq. Fl. Ind. Bat. I, Pt. 2, p. 533; Ann. Mus. Lugd. Bat. V. 5; Kurz For. Flora Burmah. I, 212; Hiern in Hook. fil. Fl. Br. Ind. I, 544; C. DC. Monog. Phan. I, 451. *M. sempervirens, Sw. Prodr.* 67; *Bot. Reg.* t. 643; *Roxb. Hort. Beng.* 33; *Fl. Ind.* ii. 395; *Wall. Cat.* 1252; *Dalz. & Gibs. Bomb. Fl. Suppl.* 15. *M. Bukayun, Royle Ill. Bot.* 144; *Griff. Itin. Notes* 355, 403.

Planted in most of the Provinces, and in all the warmer parts of both the Old and New Worlds.

2. Sandoricum, Cav.

Trees with trifoliolate, coriaceous, entire leaflets, the lateral with a short, the terminal with a long petiolule. *Flowers* pentamerous with imbricate æstivation, in axillary panicles. *Calyx* cup-shaped, its tube adnate to the base of the ovary, its lobes short. *Petals* free, oblong, obtuse. *Staminal tube* cylindric, nearly as long as the petals, the mouth 10-toothed. *Anthers* 10 or 8, included. *Disk* tubular, embracing the ovary and base of the style. *Ovary* immersed in the calyx-tube, narrowed upwards into the columnar style, 5-celled, each cell with 2 collateral pendulous ovules. *Style* clavate at the apex. *Stigmas* 5, erect, sub-cylindric, fleshy, each surrounded at the base by a fleshy ring. *Berry* superior, sub-globular, fleshy, indehiscent, 3·5-celled, and with as many arillate seeds; the aril papery outside, pulpy inside. Distrib: About seven species—all Indo-Malayan.

Stigmas united, radiating, their apices recurved ... ... **1.** *S. radiatum.*
Stigmas distinct, erect, sub-cylindric.
  Staminal tube cylindric, ventricose in the upper half ... ... 2. *S. Maingayi.*
  Staminal tube cylindric, not ventricose.
    Leaflets emarginate ... ... 3. *S. emarginatum.*
    Leaflets more or less acuminate ... 4. *S. indicum.*

1. Sandoricum radiatum, King, n. sp. A tree 40 to 80 feet high. *Leaves* 6 to 12 in. long; leaflets sub-coriaceous, broadly ovate, sub-oblique, acute or shortly acuminate, the base slightly cuneate; upper surface glabrescent or glabrous, the lower pubescent on the midrib and 8 to 10 pairs of spreading sub-prominent nerves; length 3 to 6 in.,

breadth 1·75 to 4 in.; petiolules ·2 to ·5 in., the terminal one 1·5 to 2·5 in. *Panicles* with few short branches, slender, 3 to 5 in. long, few-flowered, lax. *Flowers* ·25 in. long; the pedicels about as long, slender, puberulous. *Calyx* cupular, less than half as long as the petals, with 5 shallow broad sub-acute teeth, puberulous. *Petals* narrowly elliptic, longer than the staminal tube. *Staminal tube* cylindric, not ventricose, ridged, glabrous, its mouth with ten subulately bifid teeth: anthers ovate with broad bases, included. *Ovary* cylindric, tapering into the short style; stigmas radiating, their apices recurved. *Fruit* unknown.

Perak: Wray No. 3345; King's Collector No. 6001. Singapore: Ridley No. 4822.

This differs from the other three species in its stigmas which unite to form a radiate discoid mass, the edges being recurved; while the other three species have erect slender un-united stigmas.

2. Sandoricum Maingayi, Hiern in Hook. fil. Fl. Br. Ind. I, 554. A tree. *Leaves* 6 to 8 in. long: leaflets elliptic, sub-glabrous, sub-acuminate, the base obtuse or sub-acute; main nerves 6 to 8 pairs, depressed on the upper, prominent on the lower surface, spreading; length 2 to 5 in., breadth 1·5 to 3 in.; petiolules ·35 in., the terminal one 1·25 to 1·75 in. *Panicles* shorter than the leaves, lax, puberulous. *Flowers* ·35 to ·45 in. long, their pedicels of about the same length; bracteoles minute, subulate. *Calyx* fleshy, obscurely toothed, minutely pilose. *Petals* three times as long as the calyx, fleshy, elliptic, blunt, glabrous. *Staminal-tube* cylindrical, ventricose in the upper half, ridged; the mouth with 10 bifid teeth. *Stigmas* erect, rather long. *Fruit* unknown. C. DeCand. Mem. Phan. I, 462.

Malacca; Maingay (Kew Distrib. No. 328).

I have seen only Maingay's Malacca specimens. They resemble S. borneense, *Miq.*, of which I have seen the type specimen; but that species has narrower and longer leaflets with more numerous lateral nerves; it has also smaller flowers.

Mr. Hiern describes this as a tree, M. C. DeCandolle as a shrub.

3. Sandoricum emarginatum, Hiern in Hook. fil. Fl. Br. Ind. I, 553. A tree. *Leaves* 5 to 7 in. long; leaflets obovate to elliptic, the apex emarginate and usually mucronate, slightly narrowed to the oblique base; main nerves 5 to 6 pairs, spreading, slightly prominent; length 2 to 3·5 in., breadth 1·25 to 2 in., petiolules ·35 to ·5 in., the terminal one 1 to 1·25 in. *Panicles* short, dense; flowers ·2 in. long, shortly pedicellate. *Calyx* cup-shaped, slightly accrescent. *Staminal-tube* with 8 or 10 sub-glabrous emarginate teeth. *Fruit* (immature) sub-globular or obovoid, densely and minutely tomentose. C. DeCand. Mem. Phan. I, 461. *S. Beccarianum*, Baill. in Adansonia, 264.

Malacca: Maingay (Kew Distrib. No. 331).

I have seen only Maingay's imperfect specimens of this. The above description is copied chiefly from Hiern.

4. Sandoricum indicum, Cav. Diss. VII, p. 359, tt., 202, 203. A tree 30 to 40 feet high. *Leaves* 9 to 18 in. long; leaflets broadly ovate to ovate-rotund, shortly and abruptly acuminate, the base rounded or sub-cuneate, slightly unequal; main nerves 8 to 12 pairs, spreading, impressed on the upper, prominent on the lower surface when dry; upper surface glabrous, lower pubescent or puberulous, becoming glabrescent when old; length 4 to 8 in., breadth 2 to 4·75 in.; lateral petiolules 3 to 4 in., terminal 2 to 3 in. *Panicles* several, scattered near the apices of the branches, only a few inches long, few-flowered, minutely rusty-tomentose. *Flowers* ·4 or ·5 in. long; pedicels ·25 in., pubescent. *Calyx* minutely tomentose. *Petals* linear-elliptic, obtuse, fleshy, glabrous. *Staminal tube* narrow, fleshy, striate, glabrescent outside and puberulous inside. *Fruit* sub-globose, obtusely 5-angled at least when young, densely but minutely pubescent, 1·5 to 2 in. in diam., filled with a yellowish acid edible pulp; arillus with many spongy woody fibres; seed brown, glossy. W. & A. Prodr. i. 120; Blume Bijdr. I. 163; Adr. Jus. in Mem. Mus. xix. t. 16, f. 15; Hassk. Retzia, i. 146; Roxb. Cor. Pl. iii. 58, t. 261; Fl. Ind. ii. 392; Wall. Cat. 1249; Kurz For. Fl. Burma, I, 217; Heirn in Hook. fil. Fl. Br. Ind. I, 553; De Cand. Mon. Phan. I, 461; Miq Fl. Ind. Bot. I Pt. 2., p. 541. *Sandoricum nervosum*, Blume Bijdr. I., 165; Miq. in Ann. Mus. Lugd. Bat. IV, 30. *S. ternatum*, *Blanco Fl. Filip. ed.* i. 346. *S. glaberrimum*, *Hassk. Retzia*, i. 145. *Trichilia nervosa*, *Vahl Symb.* i. 31. *Melia Koetjape*, *Burm. Fl. Ind.* 101. *T. venosa*, *Spreng. Syst.* iii. 68.

In all the Provinces except the Nicobar Islands. Distrib. Siam; the Malayan Archipelago, Burma.

The fruit of this is edible, and on that account the species is occasionally cultivated.

3. Megaphyllæa, Hemsl.

A tree. *Leaves* large, pinnate; leaflets opposite, slightly oblique. *Panicles* extra-axillary, narrow and raceme-like, shorter than the leaves. *Flowers* more than 1 in. across when expanded *Calyx* cupular, fleshy, sub persistent, annulate and thickened below the middle; its tube adnate to the base of the ovary, its mouth irregularly 3 to 5-lobed. *Petals* 10, narrowly elliptic, thickly coriaceous, in two rows, free, imbricate. *Staminal-tube* cylindric, its mouth obscurely crenulate; anthers 10, included. *Disk* cushion-shaped, many-lobed. *Ovary* seated on the disk, depressed, 7- to 9-celled; style thick, stigma capitate, ovules one from the central angle of each cell. *Capsule* large, sub-spherical, 7- to

9-lobed, 7- to 9-celled, the pericarp very thick. *Seeds* exalbuminous, compressed, exarillate, glabrous, with large hilum and conferruminate cotyledons.

Distrib. A single Malayan species.

Megaphyllæa Perakensis, Hemsl. in Hook Ic. Plant. t. 1708. A tree 20 to 40 feet high. *Leaves* when adult 6 or 7 feet long (*fide* Hemsley), glabrous, the petiole and rachis compressed; leaflets oblong, subcoriaceous, sub-acute; the base oblique, sub-truncate or cuneate; the larger 12 to 15 in. long, 3 to 4 in. broad; petiolules ·35 to ·75 in.; main nerves 10 to 12 pairs, spreading, curving, slightly prominent beneath. *Panicles* 16 to 20 in. long; the lateral branches short, racemose, few-flowered; the main rachis 4-angled, compressed. *Flower-buds* clavate, narrowed into a pseudo-stalk as long as the pedicel proper. *Flowers* 1 in. long, and about 1·25 in. in diam. when expanded, their pedicels ·35 in. long. *Calyx* shortly cylindric, with a thick lobulated ring outside near the thickened base, puberulous outside. *Staminal-tube* shorter than the petals, pubescent inside below the insertion of the anthers, otherwise glabrous. *Anthers* elliptic. *Ovary* and lower half of style minutely tomentose. *Fruit* globular-pyriform, densely but minutely tomentose, about 3 in. in diam.; the pericarp 1 in. thick. *Seeds* 1 in. long.

Perak; at elevations of 3,000 to 4,000 feet, Scortechini, Wray, Curtis, King's Collector.

This genus was placed by its author provisionally next to *Chisocheton* to which it is no doubt closely allied, the points in which it chiefly differs from that genus being its two-ranked petals and 7- to 9-celled ovary. I give the length of the leaves as 6 to 7 feet on the authority of Mr. Hemsley who, in his figure, shows the leaflets as very numerous. None of the Herbarium specimens which I have seen enable me to estimate either the length of the former or the number of the latter.

4. Chisocheton, Blume. (*Schizochiton.*)

Trees or shrubs. *Leaves* equally pinnate; leaflets entire, opposite or sub-opposite, more or less oblique. Flowers polygamo-dioecious, in extra-axillary, rarely axillary, divaricately-branched panicles and numerous; or in spike-like racemes or cymes and few. *Calyx* small, cup-shaped or cylindric, entire or 4-5-toothed. *Petals* 4–5 or more, usually linear-elongate or cylindric, at first cohering in a tube especially below, at length spreading, somewhat imbricated or valvate. *Staminal tube* elongate, slender, tubular, 4 to 12-lobed at the apex, lobes entire or toothed; anthers linear, equal in number to and alternate with the lobes, included or somewhat exserted. *Disk* short and fleshy,

or tubular. *Ovary* short, 2- 4-celled; style filiform, usually exceeding the staminal tube; stigma capitate or cylindric, usually with a ring at its base; ovules usually one in each cell. *Capsule* sub-globose, often beaked, thickly coriaceous, 2- 4-celled. *Seeds* often enclosed in an imperfect aril; cotyledons usually peltate.—DISTRIB. An Indo-Malayan genus of about 22 species.

Inflorescence only a few inches long, much shorter than the leaves, spike-like, few-flowered; fruit beaked.

Flowers ·5 in. long, narrowly cylindrical in bud ... ... 1. *C. spicatus.*

Flowers ·9 in. long, widely cylindrical in bud ... ... 2. *C. pauciflorus*

Inflorescence extra-axillary, spike-like, a foot long or upwards, including the peduncle.

Flowers confined to the terminal two inches of the inflorescence, the peduncles very much longer; flowers ·5 or ·6 in. long, 4-merous, cylindric in bud; fruit beaked ... ... 3. *C. Kunstleri.*

Flowers on short lateral branches scattered along the rachis of the inflorescence.

Flowers ·75 to ·1 in. long, 4- or 5-merous, clavate in bud; fruit beaked 4. *C. penduliflorus.*

Flowers 1·25 to 1·5 in. long, cylindric in bud; petals 7 to 9; fruit not beaked ... ... 5. *C. rubiginosus.*

Flowers on distant lateral glomeruli 1·25 to 1·5 in. long; petals 5; fruit sub-globular, not beaked ... ... 6. *C. princeps.*

Inflorescence extra-axillary, paniculate.

Young shoots, under surfaces of leaves, petioles, and inflorescence pubescent or tomentose.

Panicles as long as the leaves; flowers ·25 in. long; petals 4, anthers much exserted from staminal tube ... 7. *C. glomeratus.*

Panicles about half as long as the leaves; flowers ·45 in. long; anthers included in staminal tube ... 8. *C. erythrocarpus.*

Rachises of leaves and both surfaces of leaflets minutely pubescent; panicles

puberulous; flowers ·5 to ·6 in. long, their buds very clavate; calyx with an annulus below its teeth ... ... 9. *C. annulatus.*

Rachises of leaves sub-glabrous; midrib and nerves of leaflets minutely pubescent on the lower surface when young; flowers ·5 to ·6 in. long, cylindric in bud; calyx not annulate ... ... 10. *C. macrophyllus.*

Leaves everywhere glabrous.

Petals 5; leaflets 2 to 4 pairs; panicles longer than the leaves, much branched; flowers ·5 in long; staminal tube truncate with about 14 broad shallow teeth ... ... 11. *C. macrothyrsus.*

Petals 4.

Mouth of staminal tube almost entire, slightly waved; flowers ·4 or ·5 in. long ... ... 12. *C. laxiflorus.*

Mouth of staminal tube with 6 long lanceolate teeth.

Flowers greenish-white, fœtid; fruit pyriform, glabrous, deep red in colour... 13. *C. patens.*

Flowers yellow, fragrant; fruit turbinate-globular, yellow when ripe ... 14. *C. divergens.*

1. Chisocheton spicatus, Hiern in Hook. fil. Fl. Br. Ind. I, 550. A tree about 30 feet high; young shoots and inflorescence deciduously tawny-tomentose. *Leaves* 8 to 12 in. long, equally pinnate; leaflets 2 or 3 pairs, opposite, membranous, oblong-lanceolate to elliptic or ovate, shortly and bluntly acuminate, the base cuneate, slightly oblique; upper surface quite glabrous, the lower with the nerves and midrib puberulous; main nerves 4 to 6 pairs, curving; length 2·5 to 5 in., breadth 1·35 to 2 in., petiolules ·25 to ·35 in. *Panicles* spike-like, axillary, 2 to 3 in. long, angled, adpressed-pubescent, few-flowered. *Flowers* ·5 in. long, their pedicels about ·1 in., pubescent. *Calyx* deeply cup-shaped, tomentose, the mouth truncate sub-entire or irregularly toothed. *Petals* 5 (sometimes 4 ?) much larger than the calyx, narrowly elliptic, united by their edges, and densely and minutely adpressed rusty-tomentose outside, glabrous inside. *Staminal tube* nearly as long as the petals, narrowly cylindric, densely adpressed-pubescent outside, the mouth with 5 broad teeth. *Stamens* 5, elongate, narrow, inserted

below the mouth, included. *Ovary* narrowly elliptic; the style long, cylindric; stigma capitate with a large central mamilla. *Fruit* transversely oblong, tapering to each end, the upper end compressed, acute, the lower terete, minutely rusty-tomentose; seeds two, sub-compressed, ·5 in. in diam., length (including the tapering ends) nearly 2 in., breadth ·75 in. C. DeCand. Mon. Phan. I, 535.

Malacca: Maingay (Kew Distrib.) No 363. Perak: Scortechini. Distrib: Sumatra, Borneo.

The fruit of this is very peculiar, being in shape something like a spear-head. The central part, in which the two seeds are contained, is transversely-oblong and thick; above this is a long compressed conical prolongation filled with a little pulp, while at the base the fruit is gradually narrowed into a stalk. The sparsely-flowered spike-like inflorescence is also peculiar in the genus.

2. Chisocheton pauciflorus, King, n. sp. A shrub or small tree; young shoots slender, puberulous, the bark dark when dry. *Leaves* 5 to 15 in. long, equally pinnate; leaflets thinly coriaceous, 2 rarely 3 pairs, oblanceolate or oblong-lanceolate, sometimes ovate or elliptic, shortly and rather abruptly acuminate, the base cuneate; the upper surface glabrous, shining; the lower dull, glabrescent, reticulate, puberulous on the midrib and nerves; main nerves 5 or 6 pairs, ascending, curving, slightly prominent beneath; length 2·5 to 9 in., breadth 1 to 4 in., petiolules ·1 to ·2 in. *Panicles or racemes* from 1 to 3·5 in. long, extra-axillary, puberulous, 2- to 6-flowered. *Flowers* about ·9 in., long; their pedicels ·25 to ·5 in., puberulous. *Calyx* fleshy, tubular, the mouth entire and truncate or with 4 or 5 shallow teeth, tomentose, about ·25 in. long. *Petals* 4 or usually 6, free, about ·8 in. long, fleshy, spathulate-elliptic or elliptic, blunt, minutely tomentose outside, glabrous inside. *Staminal tube* nearly as long as the petals, sub-glabrous, obscurely toothed at the mouth; the anthers from 4 to 8 or 10, varying with the number of petals, small, elliptic, included. Disc small, flat, tomentose. *Ovary* conical, tapering into the long cylindric style, sometimes narrowly cylindric (probably abortive). *Stigma* cylindric, obscurely 4-lobed at the apex. *Fruit* (unripe), elliptic, with a stout acute apical beak, tapered at the base, everywhere tomentose, the calyx persistent and slightly accrescent.

Perak: Scortechini; Wray, No. 2681; King's Collector, Nos. 3128, 3313, 3396, 3467 and 4455.

This species resembles *C. spicatus*, Hiern, in leaves; but has much larger flowers. Its fruit is as yet unknown. This also resembles *C. diversifolius*, Miq., in leaves, but has larger flowers.

3. Chisocheton Kunstleri, King, n. sp. A shrub 6 to 20 feet

high. *Leaves* 12 to 18 in. long, their petioles and rachises rusty-tomentose; leaflets 3 to 5 pairs, oblong-oblanceolate or lanceolate, cuspidate, slightly narrowed to the cuneate base. Upper surface glabrous except the tomentose midrib; under surface rusty-tomentose, the 16 to 18 pairs of spreading curving main nerves prominent. *Spikes* supra-axillary, solitary, on very long peduncles, rusty-tomentose; peduncles 6 to 12 in., the flowering part about 2 in. *Flowers* ·5 to ·6 in. long, crowded, subsessile, minutely bracteolate. *Calyx* cylindric, about ·1 in. long, densely tomentose, the mouth with 4 minute teeth. *Petals* 4, oblong, concave at the apex, yellowish, sericeous outside, glabrous inside. *Staminal tube* shorter than the petals and coherent with them below, glabrous, with a few scattered coarse hairs near the middle outside, the mouth with 4 broad emarginate or erose teeth; anthers 4, elliptic, included. *Ovary* ovoid, sericeous; style cylindric with a few scattered hairs, stigma cylindric with a thin annulus at its base. *Fruit* sub-globular, tomentose, with a long thick apical beak, ·75 in. in diam., the beak ·5 in. long.

Perak: King's Collector, Nos. 4502, 7783, Scortechini.

4. Chisocheton penduliflorus, Planch. ex Hook. fil. Fl. Br. Ind. I, 550. A shrub or small tree; young branches tawny-tomentose. *Leaves* 15 to 24 in. long, their rachises tawny-tomentose: leaflets 5 pairs, opposite, with occasionally a terminal odd one, elliptic to ovate, the upper occasionally sub-obovate, all shortly acuminate; rounded at the base, or narrowed from above the middle to the sub-acute minutely cordate sub-oblique base; main nerves 15 to 18 pairs, spreading, rather prominent beneath; upper surface glabrescent, the midrib and nerves pubescent; the lower reticulate, sparsely pubescent, the midrib tomentose: length 3 to 9 in., breadth 1·5 to 3 in., petiolules less than ·1 in., tomentose. *Panicles* about as long as the leaves, supra-axillary, on long drooping tomentose slender peduncles; the lateral branches few, short, densely flowered. *Flowers* ·75 to nearly 1 in. long, on very short pedicels, dull red, 4- or 5- merous, clavate in bud, the lower part very slender especially in the barren flowers. *Calyx* short, tubular, the mouth entire or 4- or 5- toothed, coarsely pubescent. *Petals* 5, linear-spathulate, concave and thickened towards the apex, longer than, and in their lower part coherent with, the staminal tube, pubescent in the middle and glabrous on the edges outside. *Staminal tube* narrow, with a few coarse adpressed hairs near the apex outside, the mouth rather deeply 3- to 6- toothed, the teeth emarginate or erose. *Anthers* 3 to 5, narrow, elongate, sessile, included or slightly exserted. *Ovary* sub-ovoid, short, sub-glabrous. *Style* long, slender, adpressed-pubescent below, glabrous above. *Stigma* discoid, thick, surrounded at the base

by an annular band. *Fruit* (unripe) ovate, tomentose, on a very short thick stalk, ·75 in. diam.; the apex with a curved thick blunt beak. C. De Cand. Mon. Phan. I, 536. *Melia penduliflora*, Wall. Cat. No. 1255.

Penang; Porter, Curtis. Malacca: Maingay (Kew Distrib.) No. 325. Perak; Scortechini, Wray, King's Collector.

In this species the flowers are of two kinds. One set, which are longer than the other, are very conspicuously clavate, the lower part being filiform; in these the ovary is small and infertile and the stamens are included. The other set have shorter thicker less clavate flowers, fertile ovaries, and exserted stamens.

5. Chisocheton rubiginosus, King n. sp. A tree 20 to 30 feet high. *Leaves* 2 to 3 feet long, the petiole and rachises tawny-tomentose, sub-compressed. *Leaflets* 4 to 8 pairs, coriaceous, sub-opposite, elliptic to oblong, very shortly acuminate, slightly narrowed to the rounded minutely sub-cordate base: upper surface glabrous, except the tomentose midrib and main nerves, sub-reticulate; the lower reticulate, rusty-pubescent; main nerves 12 to 18 pairs, spreading, rather straight, prominent beneath; length 5 to 12 in., breadth 2·5 to 4 in., petiolules about ·1 in. *Panicles* spike-like, supra-axillary, about half as long as the leaves, on long peduncles, the branches very short and crowded near the apex, bracteolate. *Flowers* rather crowded, 1·25 to 1·5 in. long, on very short pubescent pedicels. *Calyx* cylindric, cup-like; the mouth truncate, entire or with 8 or 10 shallow irregular teeth; tomentose outside, glabrous inside. *Petals* usually 7 sometimes 8 or 9, linear, sub-spathulate, slightly concave and thickened at the apex, 1 to 1·25 in. long, tomentose externally, glabrous internally. *Staminal tube* shorter than the petals and free from them, narrowly cylindric and glabrous below, slightly expanded and pubescent at the mouth; mouth with 10 to 15 linear erect teeth: anthers from 10 to 15, elongate, alternating with the teeth and of about the same length. *Ovary* ovoid, sericeous like the cylindric style; stigma cylindric. *Fruit* (unripe) ovoid, rugose, densely rusty-tomentose, 1·5 in. long.

Perak: Scortechini, Wray, King's Collector.

This species is allied to *C. princeps*, Hemsl., but has a different inflorescence and smaller leaves. I think it possible that this may be *Melia tomentosa* Roxb., a species from Penang, of which there is no specimen extant, but of which there is a drawing (reduced in size) in the Calcutta Herbarium. The only serious discrepancy is that Roxburgh describes and figures only five petals; whereas in all the Perak specimens which I have examined there are at least 7, and in many 8, or 9, and in one even 10 petals.

6. Chisocheton princeps, Hemsley in Hook. Ic. Plant. t. 1844.

An unbranched tree 40 feet high. *Leaves* 9 to 10 feet long; the rachises somewhat compressed, puberulous. *Leaflets* coriaceous, opposite, oblong, acute, the base rounded and slightly oblique: upper surface rugulose, shining, glabrous except the tomentose midrib and main nerves; lower surface reticulate-areolate tawny-pubescent; main nerves 15 to 30 pairs, spreading and little curved; length 9 to 18 in., breadth 2·5 to 4·5 in.; petiolule ·3 in., stout. *Panicles* spike-like, 3 feet or more in length; the branches distant, sub-sessile, glomeriform, each crowded with 20 to 30 elongate obovate shortly pedicellate flowers 1·25 to 1·5 in. long. *Calyx* ·2 in. long, about one-seventh of the length of the petals, cupular, entire or with 3 or 4 rudimentary teeth, truncate, puberulous. *Petals* 5, linear-spathulate, concave at the apex, adpressed-sericeous outside, glabrous inside. *Staminal-tube* slightly adherent to and shorter than the petals, cylindric, slightly wider at the minutely 10-toothed mouth; villous in the lower half inside, otherwise glabrous; anthers 10, short, linear, sub-included. *Ovary* small, cylindric, 5-grooved, surrounded by a small annular disc. *Style* cylindric, sparsely pubescent, slightly longer than the staminal-tube, cylindric. *Fruit* sub-globular, the apex depressed, the sides vertically grooved, rusty-tomentose, 2·5 in. in diam. *Seeds* 3 to 5, 1·75 in. long.

Penang: Curtis No. 1519.

A remarkable species with very long pendulous leaves.

7. Chisocheton glomeratus, Hiern in Hook. fil. Fl. Bl. Ind. I, 551. A tree 40 to 70 feet high; young shoots deciduously tomentose, the bark dark when dry. *Leaves* 12 to 18 in., the petiole and rachises pubescent; leaflets 2 or 3, rarely 4 pairs, thinly coriaceous, opposite, elliptic to elliptic-oblong, very shortly acuminate, the base rounded, unequal-sided; main nerves 9 to 11 pairs, spreading, prominent beneath; upper surface minutely punctate when dry, glabrous except the pubescent nerves and tomentose midrib; lower surface softly pubescent, the midrib and nerves tomentose; length 4 to 6·5 in., breadth 1·8 to 2·5, petiolule ·1 to ·15 in. *Panicles* solitary, drooping, supra-axillary, as long as the leaves; the lateral branches rather numerous, horizontal, pedunculate, each bearing several dense many-flowered small cymes, everywhere tomentose. *Flowers* ·25 in. long, sub-sessile, minutely bracteolate. *Calyx* short, tubular, puberulous outside, sub-entire or irregularly toothed, much shorter than the corolla. *Petals* 4, erect, elliptic, slightly concave, glabrescent. *Staminal-tube* much shorter than the petals and coherent with them, rather wide, glabrescent, the mouth with 6 to 8 long linear teeth. *Anthers* linear, elongate, much exserted. *Ovary* ovoid, tapering into the cylindric style, and like it tomentose. *Stigma* cylindric, rather long, glabrous. *Fruit* (immature) sub-globular, on thick slightly curved pedicels,

not apiculate, but tapering at the base into a short pseudo-stalk, rusty-tomentose, 1 in. in diam., seeds two. C. De Cand. in Mon. Phan. I, 532. *Schizochiton*? Wall. Cat 9040.

Penang, Porter. Perak: King's Collector, Nos. 8462, 10227, 10624.

I am not satisfied that two closely allied species are not united under the above, as there is some difference in the number of main nerves in the leaflets, those in the specimens of King's Collector, No. 8462, being rather less numerous than in the other gatherings.

8. Chisocheton erythrocarpus, Hiern in Hook. fil. Fl. Br. Ind. I, 550. A tree; young branches rather stout, densely and minutely rusty-tomentose. *Leaves* equally pinnate, 12 to 15 in. long; leaflets 4 to 6 pairs, opposite, coriaceous, elliptic-oblong to broadly ovate, shortly abruptly and bluntly acuminate, cuneate or rounded at the slightly oblique base; upper surface glabrous except the puberulous midrib; lower softly and shortly rusty-pubescent; main nerves 6 or 7 pairs, ascending, curving; length 2·5 to 5·5 in., breadth 1·35 to 2 in., petiolules 2 in. *Panicles* clustered towards the ends of the branches, extra-axillary, about half as long as the leaves, minutely rusty-tomentose; their lateral branches short, horizontal, cymose. *Flowers* ·45 in. long, their pedicels shorter. *Calyx* cylindric, the mouth truncate, sometimes minutely toothed, densely tomentose. *Petals* 6, longer than the calyx, fleshy, narrowly elliptic, blunt, adpressed-sericeous outside, glabrous inside. *Staminal-tube* shorter than the petals and pistil, outside sericeous below and glabrous above, inside villous, with 5 or 6 rather deep blunt emarginate teeth; anthers 5 or 6, included, elongate. *Ovary* narrow, pubescent; *style* tapering; *stigma* cylindric, with glabrous central mammilla. *Fruit* sub-globose, nearly 2 in. in diam, minutely tomentose, blood-red (fide Maingay) when ripe. *Seeds* ex-arillate, flattened, 1 in. long, the testa thick, orange-red. C. De Cand. in Mon. Phan. I, 534.

Malacca: Maingay (Kew Distrib.) No. 322.

9. Chisocheton annulatus, King n. sp. A tree; *leaves* 18 to 30 in. long, the petioles and rachises 4-angled, pubescent; leaflets 4 to 7 pairs, membraneous, oblong or elliptic-oblong, shortly and abruptly acuminate, the base cuneate, both surfaces with very minute pubescence; main nerves 12 to 14 pairs, oblique, rather prominent beneath; length about 9 in., breadth 3 to 3·5 in., petiolules ·25 in. *Panicles* solitary, supra-axillary, puberulous, about as long as the leaves, with scanty spike-like few-flowered branches which become shorter upwards. *Flower-buds* clavate, ·5 to ·6 in. long, contracted into a pseudo-stalk at the base, their true pedicels ·25 in. long. *Calyx* campanulate, rusty-tomentose outside, completely enveloping the petals in bud, with a thickened wavy band

about its middle, and 4 broad convenient triangular teeth. *Petals* 6 or more, the outer three sericeous outside and glabrous inside, the inner quite glabrous; all broadly elliptic, free from the staminal-tube. *Staminal-tube* shorter than the petals, cylindric, glabrescent, the mouth with shallow broad erose teeth. *Stamens* 12, attached at the very base of the tube; anthers linear-elongate. *Ovary* conic, apparently 5-celled; *style* cylindric, pubescent; *stigma* discoid, concave.

Perak; Scortechini No. 7000, Curtis No. 2693.

In its leaves, and also to some extent in its inflorescence, this agrees with the type specimen of *C. spectabile*, Miq., collected by Korthals in Borneo, and now in the Herbarium at Leiden. That specimen is in bud only, and neither Scortechini's nor Curtis's specimens have fully expanded flowers. The buds both of this and of *C. spectabile* are of the same clavate shape. Miquel does not describe the flowers of *C. spectabile*, and the buds in Korthal's type specimen are so young and so few, that I did not dare to dissect one of them. The buds on Scortechini's scanty specimens of this are also too young for accurate examination. But an examination of one of Mr. Curtis's discloses the structure above described. The flowers are remarkable because of the waved thickened band which runs round the exterior of the calyx just below the teeth. The ovary, moreover, of this appears to have 5 cells, whereas the species of the genus *Chisocheton* have only 2 or 4. This character together with the lengthening of the base of the flower into a pseudo-stalk and the annular thickening of the base of the calyx, approximate this species to the genus *Megaphyllea*. In the meantime I put it into *Chisocheton*. Good flowering specimens of this singular plant are much to be desired.

10. Chisocheton macrophyllus, King, n. sp. A tree 60 feet high. *Leaves* 5 or 6 feet long, the petiole and rachis obliquely 4-angled, subglabrous; leaflets membranous, opposite, oblong, the apex with a short blunt acumen; the base broad, rounded, unequal-sided: upper surface quite glabrous, the lower paler, minutely pubescent on the midrib and nerves when young; main nerves 18 to 20 pairs, spreading, rather prominent beneath when dry; length 5 to 13 in., breadth 3·5 to 4 in., petiolules ·3 in. *Panicles* 2 to 3 feet long, narrow, puberulous; the branches rather distant, from 1 to 3·5 in. long, the ultimate branchlets cymulose, many-flowered. *Flowers* ·5 or ·6 in. long, narrow, on pubescent pedicels less than ·1 in. long. *Calyx* cupular, pubescent, about ·05 deep, its mouth obscurely 4-toothed or entire. *Petals* 4, many times longer than the calyx, linear with spathulate concave apices, puberulous on the outer, glabrous on the inner surface. *Staminal-tube* slightly shorter than the petals, adherent to them for half its length, outside glabres-

cent below but hairy near the mouth; inside villous; mouth wider than the tube with 8 rather deep linear 2- to 3- toothed lobes; *anthers* oblong, slightly exserted. *Ovary* broadly ovoid, sericeous like the slightly compressed style; *stigma* small, cylindric, with the upper surface lobed. *Fruit* sub-globular, narrowed at the base, 3 in. in diam., the pericarp leathery thick and fleshy; pedicel very stout, swollen, 1 in. long.

Penang: Curtis No. 2469. Perak: Curtis No. 2327. Singapore: Ridley No. 4767.

11. Chisocheton macrothyrsus, King, n. sp. A tree 20 to 40 feet high. *Leaves* about 2 feet long, the petiole terete, the rachis 4-angled, glabrous; *leaflets* 2 to 4 pairs, thinly coriaceous, elliptic-oblong, minutely acuminate, the base cuneate, both surfaces glabrous; main nerves 10 to 14 pairs, prominent beneath; length 3·5 to 9 in., breadth 1·5 to 3·5 in., petiolules ·25 to ·5 in. *Panicles* longer than the leaves, angled, glabrous; the branches distant, the lower again branched, the ultimate branchlets everywhere cymose. *Flowers* ·5 in. long, on very short pubescent pedicels. *Calyx* tubular, about ·1 in. long, truncate or waved, pubescent. *Petals* 5, five times as long as the calyx, elliptic, thickened and concave at the apex, minutely tomentose outside, glaberulous inside. *Staminal tube* shorter than and free from the petals, its apex truncate, with about 14 broad shallow teeth, sericeous on both surfaces except towards the apex; anthers 7 or 8, rather small, included, attached some way below the mouth. *Ovary* ovoid-conic, sericeous like the tapering style; *stigma* cylindric, glabrous, with a flat ring at its base. *Fruit* depressed-globular, sub-rugose and with several vertical ridges, minutely tomentose, 1·5 in. in diam.

Perak: Scortechini, Wray, King's Collector.

I have seen only a single specimen in which the fruit approaches maturity. The majority of the fruiting specimens are in a young stage, and the young fruits are deeply rugose and furrowed and have a small apical beak. None of the specimens I have seen have their leaves intact, and it is possible they may have more leaflets than I have described above.

12. Chisocheton laxiflorus, King, n. sp. A tree 20 to 40 feet high. *Leaves* 1 to 2 feet long, glabrous; leaflets 4 or 5 pairs, opposite, thinly coriaceous, elliptic to elliptic-oblong, cuspidate, slightly narrowed at the base, both surfaces minutely reticulate; main nerves 10 to 15 pairs, curved, ascending, depressed above and prominent beneath when dry; length 5 to 9 in., breadth 1·75 to 3 in., petiolules ·2 in. *Panicles* solitary, extra-axillary, slender, with a few primary branches; the secondary branches short, few-flowered, the flowers usually in distant pairs sessile, ·4 or ·5 in. long. *Calyx* puberulous outside, less than ·1 in. long,

shortly cylindric, mouth entire or sometimes obscurely crenate, truncate. *Petals* 4, many times longer than the calyx, linear, obtuse, slightly concave at the apex, puberulous outside, glabrous inside. *Staminal tube* nearly as long as the petals and free from them, villous outside, glabrous inside, the mouth slightly waved. *Anthers* 5, elliptic, included. *Ovary* small (in the male flowers), sericeous. *Style* longer than the staminal tube, sericeous at the base, otherwise glabrous, stigma cylindric. *Ovary* of female flower not seen. *Fruit* depressed-globose, tapering into a short pseudo-stalk, minutely tomentose, 1·5 in. in diam., crimson when ripe.

Perak: Scortechini, Nos. 219 and 388; King's Collector, Nos. 1876, 4348, 5735, 5765, 7783.

In many respects this resembles *C. patens*, Bl., but it has larger flowers and much less pyriform fruit. The staminal tube of this is moreover only slightly toothed at the apex, whereas that of *C. patens* has 6 long lanceolate teeth.

13. Chisocheton patens, Blume, Bijdr. 169. A tree 20 to 40 feet high. *Leaves* with the petiole and rachis almost glabrous, 1 to 3 feet long; leaflets 10 to 13 pairs, opposite or sub-opposite, thinly coriaceous, oblong-lanceolate, rarely oblong-elliptic, shortly acuminate, the base narrowed and unequal sided; both surfaces glabrous, reticulate, the lower pale and with the 10 to 14 pairs of curved spreading nerves and also the reticulations prominent; length 4 to 7 in., breadth 1 to 2·5 in., petiolule ·15 to ·4 in. *Male panicles* about as long as the leaves (the female shorter), supra-axillary, pendulous, glabrous, with numerous divergent branches the lower of which are compound, the middle spike-like, and the uppermost short and cymose. *Flowers* ·35 in. long, on short rather stout pedicels. *Calyx* cupular, puberulous outside; the mouth entire, truncate or wavy. *Petals* 4, three or four times as long as the calyx, sub-spathulate elliptic, glabrous, longer than and quite free from the staminal-tube. *Staminal tube* free from the petals, cylindric, expanding slightly upwards, pubescent near the mouth, otherwise glabrous outside, pubescent inside, the mouth with 6 long lanceolate teeth which are slightly shorter than the 6 linear elongate anthers. *Ovary* very small, surrounded by a notched fleshy glabrous disc; *style* cylindric, pubescent; *stigma* cylindric, glabrous. *Fruit* pyriform, attenuated below into a thick pseudo-stalk, glabrous; length 2·25 in. of which the stalk-like part is 1 in. Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 537; Ann. Mus. Lugd. Bat. IV, 29; C. De Cand. Mon. Phan. I, 528. *C. holocalyx*, Hiern in Hook. fil. Fl. Br. Ind. I, 551. C. De Cand. l. c. 529.

Malacca: Maingay (Kew Distrib.) No. 328. Singapore; Anderson No. 30, Hullett No. 800, Ridley No. 4763. Perak: Scortechini No. 324;

King's Collector Nos. 3312, 10750; Wray No. 1279. Penang: Curtis No. 1685. Pahang Ridley No. 4765.

This species, although a much smaller tree, very much resembles *C. divergens*, *Bl.* in its leaves and inflorescence. The leaflets, however, are of a thicker texture than those of *C. divergens* and they dry of a different colour. The flowers of the two are almost exactly alike in structure; but those of *C. divergens* are yellow and very fragrant, while those of *C. patens* are greenish-white and have a disagreeable odour like that of *Paederia foetida* and of some species of *Lasianthus*. The fruits of the two moreover differ, those of *C. divergens* being turbinate-globular or nearly so, of a yellow colour, and more or less tomentose; while the fruits of *C. patens* are of a deep red colour and glabrous when quite ripe. I have compared the type specimens of *C. patens*, Bl. and of *C. holocalyx*, Hiern., deposited, respectively, at Leiden and Kew, and I find the two to be identical.

14. Chisocheton divergens, Blume, Bijdr. 169. A tree 40 to 100 feet high; young branches glabrous, the bark dark-coloured. *Leaves* 9 to 18 in. long, the main rachis deciduously puberulous; leaflets 4 to 12 pairs, membranous, opposite or sub-opposite, narrowly oblong or oblong-lanceolate, shortly acuminate, slightly narrowed to the rounded or slightly cuneate unequal base; both surfaces glabrous, reticulate, the 10 to 12 pairs of curving ascending nerves prominent on the lower when dry; length 2·5 to 6 in., breadth 1·15 to 1·75 in., petiolules ·15 to ·25 in. *Panicles* solitary, supra-axillary, pendulous, about as long as the leaves, pyramidal, the lower branches of the male panicles 6 or 7 in. long, of the female 4 or 5 in., the ultimate branchlets of both cyme-like, dense, many-flowered. *Male Flowers* ·25 in. long, on short pubescent pedicels. *Calyx* cupular, puberulous, the mouth entire or waved. *Petals* 4, three or four times as long as the calyx and slightly longer than the staminal-tube, recurved, elliptic, obtuse, sub-glabrous. *Staminal-tube* free from the petals, widely tubular, glabrous except a few strong hairs at the throat, the mouth with 6 lanceolate spreading teeth; anthers 6, linear-elongate, about as long as the teeth of the calyx. *Ovary* small, surrounded by a narrow fleshy glabrous disc; *style* cylindric, pubescent; *stigma* small, disc-like with an annulus at its base. *Female flowers* like the males, but usually without anthers; the ovary ovoid-conic, pubescent. *Fruit* obovoid or depressed-globose, tapering at the base into a pseudo-stalk, minutely tomentose, 1·5 in. in diam., 2-celled, seeds about 2. Miq. Fl. Ind. Bat. I, Pt. 2, 537; Ann. Mus. Lugd. Bat. IV. 28; C. De Cand. Mon. Phan. I, 529. *C. fragrans*, Hiern in Hook. fil. Fl. Br. Ind. I, 551; C. De Cand. l. c. 529.

Malacca: Griffith, No. 1062/1 Maingay, (Kew Distrib.) No. 324.

Perak; King's Collector, Nos. 4631, 4795, 6864? Burma: Wall. Cat. 8069.

I have compared the authentic specimens of the Leiden Herbarium of *C. patens*, Blume, with the type specimens at Kew of *C. fragrans*, Hiern; and I find them to agree exactly. I therefore adopt the older name. The male panicles of this are rather longer and wider at the base than the female panicles; but both are pyramidal. I believe the plant issued by Wallich as a *Cupania* (No. 8069 of his Catalogue) may belong to this. The specimens are in fruit only and were originally named by Wallich *Trichelia longissima*.

5. Dysoxylum, Blume.

Trees, mostly glabrous. *Leaves* pinnate; leaflets entire, opposite sub-opposite or alternate, more or less acuminate at the apex and oblique at the base, coriaceous. *Flowers* paniculate, racemose or spicate, hermaphrodite. *Calyx* 4- rarely 5-fid, dentate or partite or sub-entire, imbricated, not accrescent. *Petals* 4, rarely 5, oblong, spreading, valvate or slightly imbricated. *Staminal tube* cylindrical, dentate or crenulate at the mouth; *anthers* 6, 8 or 10, short, included or the tips exserted. *Disc* tubular, equal to or twice as long as the ovary, crenulate or entire at the mouth. *Ovary* usually 3- 4-celled; style about equalling the staminal tube; ovules usually 2 in each cell. *Capsule* globose or pear-shaped, coriaceous (often thickly so), 1- 4-celled, loculicidal; seeds arillate or exarillate, exalbuminous.—

Distrib. Species about 100, mostly found in the Malay Archipelago, but some in Australasia.

Flowers pentamerous. ... ... 1. *D. arborescens.*
Flowers tetramerous.
Inflorescence paniculate.
Panicles slender, lax, few-flowered.
Leaflets linear-lanceolate; flowers ·6 in. long ... ... 2. *D. angustifolium.*
Leaflets oblong-lanceolate, caudate-acuminate; flowers ·15 in. long ... 3. *D. dumosum.*
Panicles with few branches; the branchlets very short, spicate, distant; the flowers only ·1 in. long, densely crowded ... 4. *D. interruptum.*
Panicles with many divaricating branches, many-flowered.
Leaflets minutely rugulose when dry, their main nerves indistinct ... 5. *D. acutangulum.*

Leaflets not rugulose when dry, their main nerves distinct

Veins of leaflets winged; flowers ·25 in. long ... ... 6. *D. venulosum.*

Veins of leaflets not winged.

Disc hairy, slightly exceeding the sub-strigose ovary; flowers ·15 in. long ... 7. *D. thyrsoideum.*

Disc glabrous, half as long as the style, slightly constricted below the thickened pilose mouth, ovary densely pilose; flowers ·45 in. long 8. *D. turbinatum.*

Disc glabrous, slightly longer than the glabrous ovary; flowers ·2 in. long 9. *D. costulatum.*

Disc glabrous outside, pubescent inside, much longer than the densely adpressed-pubescent ovary; flowers ·5 in. long ... ... 10. *D. macrothyrsum.*

Inflorescence spicate or racemose.

Spikes or racemes from the stem or from the branches below the leaves.

Disc membranous, glabrous, obscurely crenate, longer than the densely pilose narrowly ovoid ovary; flowers ·3 to ·35 in. long; fruit ovoid, apiculate, glabrous ... 11. *D. cauliflorum.*

Disc fleshy, longer than the tomentose-lepidote sub-globular ovary; flowers ·25 in. long; fruit ovoid, rusty-tomentose ... ... 12. *D. Griffithii.*

Disc thinly fleshy, glabrous, crenulate, longer than the depressed sericeous ovary; flowers ·15 in. long; fruit obovoid, apiculate, obscurely 4-angled, tawny-tomentose 13. *D. densiflorum.*

Disc membranous, glabrous outside, pubescent inside, as long as the ovoid-conic sparsely pilose ovary; flowers ·35 in. long; fruit subglobose ... ... 14. *D. cuneatum.*

Spikes or racemes axillary.
Spicate cymes or racemes from 4 to 8 in. long.
Disc fleshy, glabrous, crenulate, slightly longer than the hemispheric densely puberulous ovary; flowers ·2 in. long ... ... 15. *D. racemosum.*
Disc puberulous, with thickened rugulose pilose mouth, longer than the ovoid-conic pubescent ovary; flowers ·6 in. long ... 16. *D. microbotrys.*
Spikes from 2 to 4 in. long.
Disc glabrous, longer than the puberulous 4-furrowed ovary; flowers ·35 in. long ... ... 17. *D. flavescens.*
Spikes or racemes not more than 2 in. long.
Leaves not rugulose when dry.
Disc fleshy, annular, crenulate, shorter than the conic pubescent ovary; flowers ·5 in. long ... 18. *D. andamanicum.*
Leaves rugulose or papillose.
Disc fleshy, glabrous, 8- to 9-toothed, exceeding the hemispheric ridged puberulous ovary; flowers ·2 in. long ... ... 19. *D. rugulosum.*
Flower buds globose, ·15 in. in diam.; calyx campanulate; disc none, or very small, ovary broadly ovoid ... ... 20. *D. papillosum.*

1 Dysoxylum arborescens, Miq. in Ann. Mus. Lugd. Bat. IV, 24. A tree 20 to 30 feet high. *Leaves* 6 to 9 in. long, unequally pinnate, glabrous; leaflets 2 to 3 pairs, membranous, opposite or sub-opposite, elliptic (sometimes rather broadly so), slightly obovate, shortly abruptly and obtusely acuminate, the base very cuneate; main nerves 6 to 8 pairs spreading, curving, not prominent on either surface; length 2·5 to ·5 in., breadth 1·25 to 2·25 in., the odd leaflet usually the largest; petiolules slender, ·3 to ·5 in., that of the odd leaflet often 1 in. *Panicles* extra-axillary, solitary, 1·5 to 4 in. long, with a few short lax-flowered divaricating branches. *Flowers* ·25 in. long, on thin pedicels of the same length. *Calyx* a very shallow obscurely toothed cup. *Petals* 5, linear, slightly thickened and narrowed towards the apex, glabrous, longer than the sta-

minal tube. *Staminal tube* widely cylindric, inflated or not at the base, shorter than the style, glabrous, with 10 broad shallow sub-crenate teeth; *anthers* small, ovate, included, or the tips exserted. *Disc* widely tubular, thick, fleshy, sub-crenulate, longer than the ovary. *Ovary* depressed, ovoid-globular, pubescent, 4-celled; *style* cylindric, sparsely pubescent below, glabrous above; *stigma* discoid with a broad projecting annulus at its base. *Fruit* turbinate, with 3 or 4 (sometimes only 2) vertical grooves, glabrous, not narrowed into the stalk, 1·25 in. in diam., 2- to 4- seeded. *Seeds* ovoid, apparently ex-arillate. C. De Cand. Mon. Phan. I, 489, (excl. syn. *D. lampongum*, Miq.). *D. Maingayi*, Hiern in Hook. fil. Fl. Br. Ind. I, 547; C. De Cand. l. c. 490. *Goniocheton arborescens*, Blume Bijdr. 177: Miq. Fl. Ind. Bat. I, pt. 2, p. 540. *Hartigsea acuminata*, Miq. Fl. Ind. Bat. Suppl. 196, 504. *Trichelia arborescens*, Spreng. Syst. Vol. IV, cur. post. p. 252.

Malacca: Maingay (Kew Distrib.) No. 359. Perak: Scortechini, Wray. S. Andaman; King's Collectors. Distrib. the Malayan Archipelago.

The flowers of some of the Andamans specimens are 6-merous.

2. Dysoxylum angustifolium, King n. sp. A glabrous tree; young branches slender, terete. *Leaves* 10 to 12 in. long, equally pinnate; leaflets about 5 pairs, opposite, membranous, linear-lanceolate, the base much narrowed; main nerves 9 to 12 pairs, oblique, little curved, obsolete on the upper, faint on the lower, surface; length 3·5 to 5·5 in., breadth 5 to 6·5 in., petiolules ·25 in. *Panicles* extra-axillary, slender, lax, 1·5 to 4·5 in. long. *Flowers* ·6 in. long, each at the apex of a short minutely bracteolate branchlet. *Calyx* shortly cupular, with 4 triangular teeth, glabrous, fleshy, tapering below into a short fleshy pedicel. *Petals* 4, many times longer than the calyx, linear-oblong, sub-acute, slightly thickened and connivent at the apex, minutely puberulous outside, glabrous inside. *Staminal tube* nearly as long as the petals, cylindric, rather fleshy like the petals, glabrous, very slightly wider at the obscurely 8-toothed apex; anthers 8, elliptic-oblong, included. *Disc* tubular, much longer than the ovary, and one-third of the length of the style, fleshy, glabrous except at the thickened obscurely 8-toothed pubescent mouth. *Ovary* ovoid, 4-angled, puberulous, 4-celled, tapering into the long 4-angled puberulous style; *stigma* slightly exserted, rather small, discoid, with a broad basal annulus. *Fruit* (unripe) obovoid, tapering much at the base, glabrous, about 1 in. long, peduncle 1 in.

Pahang; Ridley, Nos. 2656 and 5840.

The flowers of this have a strongly alliaceous odour.

3. Dysoxylum dumosum, King, n. sp. A shrub 3 to 6 feet high.

Leaves 5 to 14 in. long, equally pinnate, the petioles angled and channelled in front; *leaflets* opposite, 2 or 3 rarely 5 pairs, membranous, oblong-lanceolate, shortly and bluntly caudate-acuminate, much narrowed to the base; main nerves 7 or 8 pairs, curved, quite obscure on both surfaces, length 2·5 to 4·5 in. rarely 5 in.; breadth ·75 to 1·45, rarely 1·75 in., petiolules 2 in. *Panicles* shorter than the leaves, extra-axillary, pedunculate, with a few spreading scantily-flowered branches in the upper part, or racemose and branched from the base, 1·5 to 4 in. long. *Flowers* ·15 in. long, on bracteolate pedicels as long as or longer than themselves. *Calyx* cupular, much shorter than the petals, glabrous, with 4 (rarely 5) small teeth. *Petals* 4, slightly unequal, broadly oblong with truncate bases, obtuse, the apex thickened and slightly incurved, glabrous or sub-glabrous. *Staminal tube* shorter than the petals and adherent to their bases, widely cylindric, glabrous, the mouth with 8 broad shallow emarginate teeth; anthers alternate with the teeth, shortly ovate, sub-exserted. *Disc* fleshy in the fertile female flowers, slightly longer than the ovary and lobed; in the fertile male flower shorter and entire. *Ovary* depressed, pilose; *style* cylindric, sparsely pilose below; *stigma* in the fertile female broadly discoid, 5-angled, with an annular disc beneath it, in the fertile male cylindric. *Fruit* depressed-globular, glabrous, ·5 in. in diam., crowned by the base of the style, 4-celled, with 3 or 4 shining black seeds.

Perak: Scortechini, King's Collector. Johore: Ridley, No. 4194.

In habit this resembles *D. arborescens*, from which, however, it is at once distinguished by its equally pinnate leaves and tetramerous flowers.

4. Dysoxylum interruptum, n. sp. King. A tree 30 to 40 feet high; young branches cinereous-pubescent. *Leaves* 24 to 30 in. long, equally pinnate; leaflets about 10 pairs, membranous, sub-opposite or opposite, oblong to elliptic-oblong, shortly and sharply acuminate, the base cuneate; upper surface glabrous, the nerves and midrib pubescent; lower surface puberulous, the 18 to 24 pairs of straight sub-ascending main nerves rather prominent and with long sparse hairs; length 5 to 7 in., breadth 2·25 to 2·75 in., petiolules ·1 to ·2 in. *Panicles* solitary, slightly supra-axillary, with few spreading branches; the ultimate branchlets very short, distant; the flowers ovoid, densely crowded, sessile, ·1 in. long. *Calyx* cupular, pubescent, with 4 or 5 triangular acute spreading teeth. *Petals* 4, longer than the calyx, erect, valvate, elliptic, sub-acute, the sides straight, pubescent outside, puberulous inside. *Staminal tube* shorter than the petals, cylindric, glabrous, the mouth with 8 rather broad bifid teeth. *Anthers* 8, short, elliptic, included. *Disc* shortly cylindric, longer than the ovary, fleshy, glabrous; its

mouth with 8 obscure broad blunt teeth. *Ovary* depressed and broadly ovoid, pilose, 3-celled; style short, stout: *stigma* thickly discoid with an annulus at its base. *Fruit* unknown.

Perak: King's Collector, No. 6349.

A very distinct species distinguished at once by its small densely crowded flowers in interrupted spicate panicles.

5. Dysoxylum acutangulum, Miq. Fl. Ind Bat. Suppl. 196, 503; Ann. Mus. Lugd. Bat. IV., 26. A glabrous tree, the young branches rather stout with pale brown striate bark. *Leaves* 6 to 12 in. long, equally pinnate: the rachis and petiole 4-angled: leaflets 3 or 4 pairs, coriaceous, opposite or sub-opposite, unequal-sided especially towards the more or less acute base, elliptic or ovate, or sometimes slightly obovate, the apex acute or shortly acuminate, both surfaces minutely rugulose and of a pale olivaceous colour when dry; main nerves imperceptible; length 2·5 to 4·5 in., breadth 1·25 to 2·2 in., petiolule ·2 to ·25 in. *Panicles* 2·5 to ·4 in. long, spreading, puberulous, *Flowers* rather crowded, ·35 in. long. *Calyx* puberulous, very shallow, with 4 deep reflexed triangular teeth. *Petals* 4, thin, much larger than the calyx, oblong, sub-acute, puberulous on both surfaces. *Staminal tube* a little shorter than the petals, cylindric, the mouth with 8 rather deep sharp teeth, striate, puberulous on both surfaces; *anthers* 8, oblong, rather small, slightly exerted. *Disc* widely tubular, slightly exceeding the ovary, fleshy, its mouth slightly inflexed, obscurely 8-toothed. *Ovary* adpressed-pubescent, broadly ovoid, tapering into the long style: style glabrescent in its upper part, adpressed-pubescent in the lower. *Stigma* exserted, shortly cylindric, with a small annulus at its base. *Fruit* obovoid, 3 in. long; the pericarp very coriaceous, glabrous, pale brown when dry and minutely rugulose, 3-celled. *Seeds* one in a cell, ellipsoid and apparently when fresh embedded in pulp. C. DC. in Mon. Phan. I., 525.

Singapore: Ridley, No. 3828. Perak: Scortechini, No 1048. Distrib. Bangka.

The late Fr. Scortechini collected only a single specimen of this which is in flower, and Mr. Ridley collected it in fruit in Singapore. These specimens agree absolutely in their leaves with a specimen from Bangka now in the Leiden Herbarium on which Miquel founded the species.

Miquel does not describe the flowers, and the specimen lent to me by the Leiden Herbarium has none. In the Leiden Annals, Miquel expresses a doubt whether this plant may not be Aurantiaceous. The flowers (which Miquel had never seen) are however unmistakably Meliaceous, and the leaflets moreover are not pellucid-dotted.

6. Dysoxylum venulosum, King, n. sp. A tree 50 to 80 feet high; young branches rather stout, angled, puberulous. *Leaves* 12 to 18 in. long, the petiole and rachis angled and puberulous, equally or unequally pinnate; leaflets 7 to 14, membranous, alternate, oblong, slightly unequal-sided, acuminate, the base much narrowed and oblique; both surfaces glabrous, the 13 to 15 pairs of oblique curving main nerves indistinct on the upper, rather prominent on the lower, the veins on both surfaces prominent and winged when dry; length 5 to 7 in., breadth 1·35 to 1·75 in., petiolules ·25 in. *Panicles* extra-axillary, 6 to 8 in. long, glabrescent; the branches numerous, short, sub-horizontal, few-flowered. *Flowers* ·25 in. long; their pedicels about the same length, jointed at the middle. *Calyx* cupular, with 4 shallow teeth, glabrous. *Petals* 4, much longer than the calyx, densely hairy, puberulous externally, sparsely so internally, oblong, obtuse, the apex slightly thickened and inflexed. *Staminal tube* slightly shorter than the petals, glabrous, cylindric, its mouth irregularly and minutely toothed; anthers 8, oblong, inserted below the mouth of the tube. *Disc* cylindric, fleshy, glabrous, about as long as the ovary, the mouth with 4 broad minutely erose teeth. *Ovary* ovoid, hoary-pubescent, tapering into the long cylindric sub-glabrous style; *stigma* slightly exserted, thickly discoid with an annulus at its base. *Fruit* unknown.

Perak: King's Collector, No. 1036.

7. Dysoxylum thyrsoideum, Griff. ex Hook. fil. Fl Br. Ind. I., 547. A tree; leaves 12 to 16 in. long, their petioles and rachises angled: leaflets about 8, alternate, coriaceous, elliptic-oblong to elliptic, shortly acuminate, slightly narrowed to the oblique base, both surfaces quite glabrous; main nerves 6 to 8 pairs, curved, ascending, slightly depressed in the upper and prominent on the lower surface when dry; length 4·5 to 8·5 in., breadth 1·75 to 3 in., petiolules ·3 in. *Panicles* slightly extra-axillary, pyramidal, with stout rachises less than half the length of the leaves; their main branches divaricating, the ultimate racemose; flowers numerous, 15 in. long, their pedicels nearly as long. *Calyx* one-third of the length of the petals, cupular, coarsely and irregularly 4-toothed, glabrous. *Petals* 4, oblong, obtuse, glabrous. *Staminal tube* shorter than the petals and attached to them, cylindric, glabrous outside, pubescent inside, its mouth with 8 broad sub-crenate teeth; *anthers* short, ovate, included. *Disc* tubular, fleshy, hairy, slightly exceeding the ovary, truncate. *Ovary* narrowly ovoid, sub-strigose, 3-celled; *style* cylindric, thick, as long as the staminal tube; *stigma* exserted, discoid with a basal ring. *Fruit* (fide Hiern) "obovoid, fleshy, 2- 3-lobed, umblicate, nearly 1 in. long; fruiting peduncles woody, stout, seeds ex-arillate." C. DC. in Mon. Phan. I., 481.

Malacca, Griffith, (Kew Distribution) No. 1053. Penang: Curtis, Nos. 2467, 2468. Andamans: King's Collectors.

Var. *Andamanica*: flowers ·25 in. long, calyx very short: panicles sometimes as long as the leaves, lax.

S. Andamans. King's Collectors.

This differs from typical *D. thyrsoideum* chiefly in the points above noted. When better specimens of the typical Malacca form are obtained, characters may be found sufficient to separate the two specifically.

8. Dysoxylum turbinatum, King n. sp. A small tree 12 to 20 feet high; young branches rather stout, the bark pale brown and striate. *Leaves* 10 to 16 in. long, the petioles and rachises glabrous, terete, equally pinnate; leaflets 2 to 4 pairs, sub-opposite, thinly coriaceous, elliptic to elliptic-oblong, shortly and bluntly acuminate, the base rounded or slightly narrowed, not oblique; both surfaces glabrous, the lower subglauceous, very minutely dotted, the nerves pubescent when young; main nerves 8 to 11 pairs, curved, spreading, very prominent on the lower, slightly depressed on the upper surface; length 3 to 6 or even 8 in., breadth 1·5 to 2·5 in. or even 3·5 in., petiolules ·35 in. *Panicles* supra-axillary, 3 to 11 in. long, puberulous, rather slender, with few distant minutely bracteolate branches each bearing 5 to 10 flowers mostly in its upper half. *Flowers* ·45 in. long. *Calyx* cupular, pubescent, narrowed to a short fleshy pedicel, its mouth with 4 short triangular teeth. *Petals* 4, linear-oblong, thickened and slightly concave at the apex, minutely adpressed-pubescent outside, with a few fleshy hairs inside at the apex, otherwise glabrescent. *Staminal tube* cylindric, slightly shorter than the petals, the mouth with 8 shallow broad truncate teeth, puberulous outside, glabrous inside. *Anthers* oblong, short, included. *Disc* half as long as the style, tubular, slightly constricted below the thickened pilose mouth, otherwise glabrous. *Ovary* narrowly ovoid, densely pilose; style 4-angled, glabrescent; stigma slightly exserted, small, discoid, with a basal annulus. *Fruit* depressed-globular, tapering at the base into a short pseudo-stalk, covered with brownish pale-edged scales, 1·5 in. length (excluding the pseudo-stalk) and slightly more in diameter.

Perak: King's Collector, No. 8751. Johore: Herb. Ridley, No. 4060. Malacca: Griffith.

In the above description the flowers are described from the specimens of Mr. Ridley and of my own collector, and the fruit from a single Griffithian specimen from Malacca which has no flowers, the three being in my opinion identical.

9. Dysoxylum costulatum, Miq. in Ann. Mus. Lugd. Bat. Vol. IV.,

21. A glabrous tree 40 to 50 feet high. *Leaves* 9 to 14 in. long; *leaflets* sub-coriaceous, opposite, about 4 pairs, elliptic-oblong or elliptic, cuspidate or shortly acuminate; the base acute, slightly oblique; main nerves 10 to 12 pairs, curved, spreading, stout and prominent on the lower surface; length 3·5 to 6 in., breadth 1·5 to 2·75 in., petiolules about ·3 in. *Panicles* axillary or terminal, about half as long as the leaves or less; their branches divaricating and racemoid, glabrous. *Flowers* not crowded, about ·2 in. long, on short pedicels, bracteolate; pedicels cylindric in bud. *Calyx* a very short obscurely 4-toothed cup. *Petals* 4, oblong, obtuse, minutely puberulous externally. *Staminal tube* free from and nearly as long as the petals, cylindrical, the mouth with 8 broad shallow crenulate teeth, glabrous outside, villous inside. *Anthers* 8, short, ovate, included. *Disc* tubular, glabrous, crenately 4-toothed, longer than and surrounding the ovary. *Ovary* glabrous, narrowly ovoid, tapering into the cylindric style. *Stigma* slightly exserted, discoid with a band round its base. *Fruit* depressed-globular with 3 shallow vertical grooves; tapering at the base into a pseudo-stalk, 1·5 in. or more in diam., 4-celled; the pericarp woody, glabrous. Seeds sub-globular. C. De Cand. in Mon. Phan. I, 503. *D. brevipes*, Hiern in Hook. fil. Fl. Br. Ind. I, 560; C. DC. in Mon. Phan. I, 503. *Hartighsea costulata*, Miq. Fl. Ind. Bat. Suppl. 196, 505.

Malacca: Griffith; Maingay, Nos. 319, 320 (Kew Distrib.), Stolickza, Wray, King's Collector. Pahang: Ridley. Singapore: Ridley. Distrib. Sumatra.

The type specimens of *D. brevipes* Hiern at Kew agree exactly with those of the older *D. costulatum* Miq. in the Royal Herbarium at Leiden.

10. Dysoxylum macrothyrsum, Miq. in Ann. Mus. Lugd. Bat. IV., 20. A tree 30 to 60 feet high; young branches rather stout, striate. *Leaves* 11 to 16 in. long, equally pinnate, the petioles and rachises puberulous: *leaflets* thinly coriaceous, 3 or 4 pairs, opposite, oblong-lanceolate to elliptic-oblong or elliptic, shortly acuminate, the base cuneate and slightly oblique; upper surface glabrous except the sometimes puberulous midrib, the lower glabrous: main nerves 8 to 11 pairs, spreading, prominent and almost winged on the lower faintly depressed on the upper surface; length 3 to 5·5 in. or even 7 in., breadth 1·5 to 2·25 in., petiolules ·25 to ·4 in. *Racemes* slightly supra-axillary, slender, puberulous, few-flowered, 4 to 7 in. long. *Flowers* ·5 in. long, distant, on short bracteolate pedicels. *Calyx* a short fleshy rugulose puberulous cup, with 4 broad triangular teeth. *Petals* 4, deflexed, many times longer than the calyx, narrowly oblong, slightly widened at the base; the apex sub-acute, slightly thickened and inflexed, externally with dense pale adpressed hairs, internally glabrescent. *Staminal tube*

shorter than the petals, cylindric, adpressed-pubescent outside, the mouth almost entire or minutely toothed. *Anthers* 8, linear-elliptic, their apices not reaching the mouth of the tube. *Disc* much longer than the ovary, cylindric, glabrous externally, softly pubescent internally especially at the acutely 8-toothed mouth. *Ovary* narrowly ovoid-conic, tapering into the long glabrous cylindric style, 4-angled, densely adpressed-pubescent; stigma exserted, thickly discoid, rugulose, with a narrow annulus at its base. *Fruit* turbinate, with four shallow vertical grooves and four broad rounded angles, sub-glabrous, crowned for a time by the persistent stout short style, when fully ripe white slightly tinged with pink, about 1·25 in. long, and 1·5 in., or more in diam. C. DC. in Mon. Phan. I, 485. *D. Lampongum*, Miq. Fl. Ind. Bat. Suppl. 196, 303 (excl. var. B., fide Miq. Ann. Mus. Lugd. Bat. IV., 20.)

Perak: King's Collector, Nos. 5428, 6788, 10440; Wray, Nos. 2329, 3072. Selangore: Ridley, No. 1892. Distrib. Borneo.

I follow Miquel and M. C. deCandolle in keeping this species up. It is, however, very closely allied to *D. excelsum*, Bl. The panicles of Perak specimens are rather shorter and fewer-flowered than in those collected in Borneo; in other respects they agree.

11. Dysoxylum cauliflorum, Hiern in Hook. fil. Fl. Br. Ind. I., 549. A tree 30 to 50 feet high. *Leaves* 1 to 2 feet long, their petioles and rachises deciduously rusty-puberulous, angled, unequally pinnate; leaflets 9 to 13, membranous, opposite or alternate, oblong-elliptic or elliptic, shortly acuminate, the base cuneate or rounded at one side and obliquely cut away at the other; both surfaces glabrous except the pubescent midrib; main nerves 8 to 13 pairs, spreading, rather prominent on the lower surface; length 4 to 7 in. occasionally 12 in., breadth 1·75 to 2·75 in., petiolules ·2 to ·3 in. *Spikes* from 1 to 3 in. long, tawny-tomentose, in dense clusters on rugose woody tubercles from the stem. *Flowers* ·3 to ·35 in. long, their pedicels about ·1 in., bracteolate at the base. *Calyx* cupular, with 3 or 4 broad irregular teeth, pubescent. *Petals* 4, oblong, obtuse, glabrous inside, glabrous or puberulous outside, free from the staminal tube. *Staminal tube* cylindric, glabrescent or sparsely sericeous outside, sericeous inside, the mouth with 8 broad shallow bifid teeth; *anthers* 8, ovate, included. *Disc* tubular, membranous, longer than the ovary, glabrous, the mouth obscurely crenate. *Ovary* narrowly ovoid, densely pilose; the style cylindric, sparsely pilose in the lower, glabrous in the upper half. *Stigma* slightly exserted, broadly discoid with a narrow annulus at its base. *Fruit* ovoid, apiculate, tapering slightly at the base, substriate, glabrous, red-coloured, splitting into 4 valves. *Seeds* sub-globular, plano-convex, ·5 in. long. C. DC. in Mon. Phan. I., 498.

Malacca: Griffith, Maingay, No. 327 (Kew Distrib.). Singapore; Anderson, Hullet. Perak: Scortechini, Wray, King's Collector.

12. Dysoxylum griffithii, Hiern in Hook. fil. Fl. Br. Ind. I., 549. A tree. *Leaves* 12 to 18 in.; leaflets 9 to 13, membranous, alternate, oblong-lanceolate, acuminate, the base cuneate, glabrous, shining, (olivaceous when dry); main nerves numerous, spreading, indistinct on both surfaces, the midrib thin but slightly prominent on the lower; length 3 to 5 in., breadth 1 to 1·5 in., petiolules ·1 in., *Racemes* from the axils of fallen leaves, ·5 to 1·5 in. long, stout, minutely bracteolate. *Flowers* ·25 in. long, their pedicels less than ·1 in. *Calyx* nearly flat, very short. *Petals* 4, oblong, obtuse, puberulous outside. *Staminal tube* slightly shorter than the petals, cylindric; its mouth with 8 broad shallow sub-emarginate teeth, puberulous outside; anthers 8, ovate, their tips exserted. *Disc* shortly cylindric, crenulate, fleshy, longer than the ovary. *Ovary* sub-globular, 4-angled, minutely tomentose-lepidote, 3- to 4-celled. *Style* as long as the staminal tube, 4-angled, puberulous: *stigma* discoid with an annulus at its base. *Fruit* unknown. C. DC. in Mon. Phan. I., 497. *Hartighsea ramiflora*, Griff. Notulæ IV., 501.

Malacca, Griffith.

This does not appear to have been collected since Griffith originally found it (1845) at Malacca. It is a very well-marked species, and Griffith's original description of it is, in all respects except that of fruit, full and clear.

13. Dysoxylum densiflorum, Miq. in Ann. Mus. Lugd. Bat. IV, 9. A tree 20 to 40 feet high. *Leaves* unequally pinnate, 15 to 20 in. long, their petioles and rachises angular, deciduously puberulous. *Leaflets* 11 to 13, opposite or alternate; the terminal larger than the others; more or less obovate and with a longer petiolule; lateral leaflets elliptic or elliptic-oblong, slightly oblique, acute or shortly acuminate, the base rounded or sub-cuneate and unequal, both surfaces glabrous; main nerves 10 to 12 pairs, spreading, curved, slightly prominent beneath; length 4·5 to 7 in., the terminal 1 or 2 in. longer; breadth 2 to 2·5 in., the terminal sometimes 3 in.; petiolules ·15 in., the terminal ·75 to 1 in. *Spikes* in clusters from woody tubercles on the stem, 1 to 2 in. long, tawny-tomentose. *Flowers* (in bud only), about ·15 in. long, sub-globular, their pedicels slightly shorter with bracteole at the base. *Calyx* almost as long as the petals, campanulate, coarsely pubescent, its mouth with 4 large irregular teeth. *Petals* 4, free, slightly imbricate, sub-orbicular (in bud), the apex slightly inflexed. *Staminal-tube* nearly as long as the petals, glabrous, widely tubular, divided almost to the base into 8 broad sub-truncate erose teeth; *anthers*

8, included, elongate-elliptic, alternate with the lobes. *Disc* cylindric, short but longer than the ovary, thinly fleshy, crenulate, glabrous. *Ovary* depressed, 4-celled, sericeous as is the base of the short stout style; *stigma* slightly exserted, discoid. *Fruit* (young) narrowly obovoid, shortly apiculate, narrowed at the base into a pseudo-stalk, obscurely 4-angled, densely but minutely tawny-tomentose, 1·5 in. long, including the pseudo-stalk. C. DC. Monog. Phan. I, 499. *Epicharis densiflora*, Blume Bijdr. 167; Miq. Flor. Ind. Bat. Vol. I, pt. 2, p. 539. *Epicharis altissima*, Blume *ex* Miq. l.c. *Guarea densiflora*, Spreng., Syst. IV, 251.

Perak: King's Collector, Nos. 4934, 8826, 10093 and 10443. Wray No. 437. Scortechini, No. 1661. Distrib. Java, Sumatra.

In the youngest stages the fruit is ovoid: as it ripens it becomes obovoid and the base becomes narrowed into a pseudo-stalk.

14. Dysoxylum cuneatum, Hiern in Hook. fil. Fl. Br. Ind. I, 551. A large tree. *Leaves* 18 to 30 in. long, unequally pinnate; leaflets about 13, sub-coriaceous, opposite or sub-opposite, elliptic-oblong, shortly cuspidate; the base cuneate, unequal-sided; both surfaces glabrous, the lower punctate; main nerves 14 to 17 pairs, spreading, slightly prominent beneath when dry; length 4 to 7 in., breadth 2 to 3 in.; petiolules ·15 in., stout, that of the terminal leaflet ·75 in. *Spikes* cinereous-tomentose, only a few inches long in flower, but elongating much in fruit, (from the branches below the leaves?) clustered. *Flowers* ·35 in. long, sub-sessile, bracteolate. *Calyx* half as long as the petals, campanulate, with 4 obtuse irregular deep teeth, pubescent. *Petals* 4, oblong, sub-imbricate, sub-glabrous *Staminal-tube* longer than the petals, glabrescent outside, villous inside, the mouth with 8 obtuse shallow teeth. *Anthers* 8, shortly ovate, included. *Disc* membranous, tubular, about as long as the ovary, glabrous outside, pubescent inside, its mouth minutely crenulate. *Ovary* ovoid-conic, pilose; style cylindric, sparsely pilose in the lower part, glabrous above, *stigma* discoid with an annulus at its base. *Fruiting-spike* half as long as the leaves: ripe fruit subglobose, about 1 in. in diam., sub-glabrous, the pericarp splitting into about 4 valves; seeds oblong, plano-convex, ·75 in. long, C. DC. in Mon. Phan. I, 496.

Malacca: Maingay (Kew Distrib.), No. 322-2.

Known only by Maingay's scanty specimens; allied to *D. cauliflorum* in inflorescence flowers and fruit.

15. Dysoxylum racemosum, King n. sp. A shrub, all parts glabrous except the young shoots and the inflorescence. *Leaves* 12 to 18 in. long, equally pinnate. *Leaflets* membranous, alternate, elliptic-oblong, the apex shortly acuminate, the base broad, slightly unequal; main nerves 8 to 10 pairs, curving, spreading, slightly prominent beneath,

length 5 to 8 in., breadth 2·25 to 3 in., petiolules ·25 in. *Racemes* slightly supra-axillary, solitary, 4 to 5 in. long, puberulous. *Flowers* scattered, ·2 in. long, on slightly shorter thick bracteolate pedicels. *Calyx* a shallow puberulous cup with 4 obscure shallow lobes. *Petals* 4, much longer than the calyx, elliptic, slightly oblique, the apices slightly concave and thickened, the bases truncate, puberulous on both surfaces. *Staminal-tube* slightly shorter than the petals and style, widely cylindric, sparsely puberulous, the mouth with 8 broad 3-toothed lobes. *Anthers* shortly ovate, their apices exserted. *Disc* slightly longer than the ovary, shortly cylindric, fleshy, glabrous, crenulate. *Ovary* hemispheric, densely puberulous, tapering into the thick style. *Stigma* subcapitate, with an annular disc at its base. *Fruit* ovoid, deciduously rusty-puberulous with round smooth pits, the pericarp leathery; length 1·5 to 2 in., diam., ·9 to 1·35 in.

S. Andaman and Nicobar Islands; King's Collectors.

This bears, especially in its inflorsescence, a resemblance to *D. grande*, Hiern; but this is quite glabrous, while that has leaves very pubescent beneath; the fruit also is different.

Var. *arborea*; 20 feet or more in height, leaves up to 20 in. long, leaflets often much narrowed to the base, longer and with more nerves; spikes often 12 in. long.

16. Dysoxylum microbotrys, King n. sp. A tree 40 to 60 feet high. *Leaves* 12 to 20 in. long, equally pinnate, their petioles and rachises glabrescent or glabrous; leaflets thinly coriaceous, opposite, about 3 pairs, elliptic or elliptic-oblong, broadly cuspidate, the base cuneate, both surfaces glabrous; main nerves 9 to 11 pairs, oblique, rather straight, slightly prominent beneath when dry; length 6 to 10 in., breadth 2·5 to 3·5 in., petiolules ·25 to ·35 in. *Cymes* spike-like, solitary, extra-axillary, 4 to 8 in. long, few-flowered. *Flowers* ·6 in. long, usually solitary, on pedicels ·15 in. long, bracteolate at the base. *Calyx* a shallow slightly 4-toothed puberulous rugulose cup. *Petals* 4, puberulous, oblong, slightly widened at the base; the apex sub-acute, thickened and incurved. *Staminal-tube* slightly shorter than the petals and style, everywhere puberulous; its mouth not expanded but with many broad shallow obscure teeth. *Anthers* 8, narrowly elliptic, inserted about their own length below the mouth. *Disc* longer than the ovary, tubular, puberulous; the mouth thickened, rugulose, pilose. *Ovary* ovoid-conic, pubescent; *style* 4-angled, pubescent in its lower, glabrous in its upper, half; *stigma* discoid, with a narrrow annular band at its base, 4-celled, each cell with 2 ovules *Fruit* pyriform, the top often much flattened, 1·5 to 2 in. long, and from 1·25 to 15 in. in diam., sub-glabrous, the pericarp rather thick. *Seeds* about ·75 in. long, plano-convex.

Perak: King's Collector, Nos. 10551, 10580, and probably also No. 10181.

17. Dysoxylum flavescens, Hiern in Hook. fil. Fl. Br. Ind. I, 549. A tree. *Leaves* 1 to 2 feet long; leaflets 9 to 13, membranous, alternate, elliptic, oblique, shortly acuminate, glabrous; the base slightly oblique, rounded; main nerves numerous, sub-horizontal, very indistinct on both surfaces, the midrib prominent especially on the lower; length 3 to 5 in., breadth 1·25 to 2 in., petiolules ·2 to ·25 in. *Spikes* axillary, 2 to 4 in. long. *Flowers* crowded, ·35 in. long, sub-sessile, 4-merous, puberulous. *Calyx* very short, nearly flat, 4-toothed, roughly puberulous. *Petals* 4, minutely pilose outside, glabrous inside, slightly imbricated, pale yellow. *Staminal-tube* glabrous below, slightly pilose above, its mouth crenate. *Anthers* 8 or 10, ovate, included. *Disc* glabrous, exceeding the ovary, dull reddish-orange, its mouth entire or undulate. *Ovary* minutely 4-furrowed, hairy, 4-celled; style cylindrical, hairy; *stigma* discoid. C. DC. in Mon. Phan. I, 494.

Malacca: Maingay (Kew Distrib.), No. 321.

This is known only by Maingay's scanty and incomplete specimens. The preceding description is largely taken from Maingay and Hiern.

18. Dysoxylum andamanicum, King n. sp. A tree 20 to 30 feet high. *Leaves* 6 to 10 in. long, unequally pinnate, the petiole and rachises angled, very pale when dry; leaflets 3 to 5, membranous, alternate, oblong to ovate, slightly oblique, shortly and bluntly acuminate, the base cuneate or rounded, both surfaces glabrous; main nerves 6 to 10 pairs, spreading: length 3 to 5 in., breadth 1·35 to 1·75 in., petiolules ·25 in. *Spikes* slightly supra-axillary, 1 to 2 in. long, few-flowered, puberulous. *Flowers* ·35 in. long, their pedicels about 2 in., puberulous. *Calyx* a shallow minutely 4-toothed glabrous cup. *Petals* 4, much longer than the calyx and slightly imbricate, oblong, sub-acute, convex at the apex, pale puberulous especially externally, reflexed, rarely deciduous. *Staminal tube* shorter than the petals, widely cylindric, slightly inflated near the base, slightly puberulous, the mouth with 9 or 10 broad erose teeth. *Stamens* 8 to 10, alternate with the teeth; *anthers* shortly ovate, slightly exserted. *Disc* fleshy, annular, crenulate, shorter than and adherent to the ovary at its base. *Ovary* conic, densely white pubescent, tapering into the stout style; *stigma* included, discoid with a small annulus at its base. *Fruit* depressed-globular, obscurely 3-grooved, glabrous, the pericarp thickly coriaceous, 1·25 in. in diam. *Seeds* 2 or 3, elliptic.

South Andaman: King's Collector.

19. Dysoxylum rugulosum, King n. sp. A tree 15 to 25 feet high:

young branches with striate pale brown bark. *Leaves* 8 to 12 in. long, equally pinnate, the petiole and rachis shorter than the uppermost pair of leaflets; leaflets 2 pairs, the upper pair much the larger, opposite, thickly membranous, pale and minutely rugulose when dry, oblong-oblanceolate, shortly and abruptly acuminate, the base much narrowed; main nerves 8 to 14 pairs, spreading or ascending, faint on the upper surface, prominent and almost winged on the lower: length of the lower pair 3·5 to 4·5 in., breadth about 1·5 in., length of the upper pair 6 to 8 in., breadth about 2·25 in.; petiolules about ·15 in., stout. *Racemes* supra-axillary, ·5 to ·75 in. long, 3- or 4-flowered, puberulous. *Flowers* ·2 in. long, their pedicels shorter. *Calyx* almost flat, 4-cornered, rugulose outside and puberulous, inside glabrous and reticulate. *Petals* 4, much longer than the calyx, elliptic, puberulous outside, glabrous inside, the apex sub-acute slightly thickened and inflexed, the base truncate. *Staminal tube* shorter than the petals, cylindric, slightly ridged and puberulous outside, glabrous inside, the mouth with 8 or 9 broad shallow emarginate teeth; *anthers* elliptic, not exserted. *Disc* shortly cylindric, slightly exceeding the ovary, fleshy, glabrous 8-or 9-toothed. *Ovary* hemispheric, ridged, puberulous, tapering into the long cylindric puberulous style; *stigma* exserted, discoid, with a broad annulus at its base. *Fruit* on a short stout pedicel, pyriform, apiculate, with numerous vertical rugae, puberulous, 1·25 in. long, and ·8 in. in diam. at the broadest part.

Perak: King's Collector, Nos. 2863, 3158, Scortechini.

This resembles *D. macrocarpum*, Bl. in its leaves, but its flowers are much smaller and are in short racemes, not in panicles.

20. Dysoxylum papillosum, King n. sp. A shrub 6 to 8 feet high; young branches rather stout, densely tawny-tomentose. *Leaves* 12 to 18 in. long, equally pinnate, their petioles and rachises tomentose, more or less angled; leaflets 2 or 3 pairs, the upper pair the largest, opposite or sub-opposite, coriaceous, broadly oblanceolate, shortly acuminate, tapering from above the middle to the very narrow base; both surfaces when dry minutely papillose, many of the papillae and especially those on the upper surface with perforated apices; the upper surface glabrous, olivaceous green when dry; the lower yellowish-brown, the main nerves and midrib pubescent; main nerves 10 to 15 pairs, prominent on the lower, depressed on the upper surface when dry; length 6 to 12 in., breadth 2·25 to ·5 in., petiolules only ·15 in., stout, tomentose. *Spikes* extra-axillary, ·75 to 1·25 in. long, the rachis stout, woody, tomentose. *Flower-buds* globose, ·15 in. in diam., on very short thick pedicels. *Calyx* campanulate, enveloping the petals, 4-toothed, membranous, densely tomentose externally. *Petals* 4, fleshy, broadly

ovate, with truncate bases and sub-acute apices, concave, densely adpressed-pubescent outside, glabrous inside. *Staminal tube* much shorter than the petals, cylindric, rather fleshy, glabrous, the mouth with 8 broad shallow emarginate teeth; *anthers* 8, oblong, longer than the tube, much exserted. *Disc* (if any) very small. *Ovary* broadly ovoid, tapering into the short thick style which is sparsely pilose towards the base: *stigma* thick, discoid, depressed in the centre. *Fruit* unknown.

Perak: King's Collector, No. 10755.

The disc in this plant, if present at all, must be very small, for I cannot detect it in the bud. In spite of this I refer it to *Dysoxylum*, of which it has the general facies. The shrubby habit, short thick spicate inflorescence, globular flower-buds, and the occasionally perforated leaves make this a remarkable and easily recognisable plant.

6. Amoora, Roxb.

Trees. *Leaves* usually unequally-pinnate; leaflets oblique, quite entire. Flowers in axillary subdiœcious panicles, the females sometimes spicate or racemose. *Calyx* 3- 5-partite or -fid. *Petals* 3, thick, concave, imbricated. *Staminal tube* sub-globose or campanulate, entire or inconspicuously 6–10-crenate; anthers 3–10, included. *Disc* obsolete. *Ovary* sessile, short, 3-celled; cells 1-2-ovuled, stigma sessile. *Capsule* sub-globose, coriaceous, 3-celled and -seeded, loculicidally 3-valved, or indehiscent. *Seeds* in a fleshy aril, with ventral hile.—Distrib. A genus of about 25 species occurring only in India and the Malay Archipelago, and also 1 endemic species in Australia.

The Indian species of *Amoora*, as this genus is understood by the most recent botanical writers, fall into two groups. One of these (the old genus *Aphanamixis*) is a very natural one. In this group the male flowers are in panicles with divergent racemose or spicate branches, while the female flowers are in short racemes. The flowers of both sexes have a 5-merous calyx, and a 3-merous corolla, 3 or 6 stamens, 3-celled ovaries and 3-celled loculicidally dehiscent capsular fruits. The other group, named *Pseudo-Aglaia* by M. C. de Candolle, consists of a number of species with from 6 to 10 stamens, 3-celled-ovaries, and large stigmas. Some of these have 3 petals, others have 4 or 5. As regards fruit some of them (*e.g.*, *A. cucullata*) have a 3-celled capsule like that of *Aphanamixis*: others have fruits which show no evidence of dehiscence. In treating this genus, I have excluded all the species having more than 3 petals, and I have abandoned dehiscence in the fruit as a diagnostic character. In the note under the genus *Aglaia*, I have explained the change which I have made in the staminal character of that genus. I may here add that *Amoora Chittagonga*, Hiern, is certainly an *Aglaia*; and that *Amoora decandra* Hiern, with its 10 anthers in two rows, and 5-celled ovary and fruit, is more of a *Lansium* than an *Amoora*.

Section I. Male flowers in panicles, female flowers in short spikes or racemes, sepals 5, petals 3; fruit 3-celled, capsular, loculicidal.

Stamens 3 ... ... 1. *A. Sumatrana.*

Stamens 6 ... ...

Male flowers ·15 in. long ... ... 2. *A. Rohituka.*

Male flowers ·3 in. long ... ... 3. *A. Aphanamixis.*

Section II. Male and perfect female flowers mixed in the same panicles: calyx cupular, 3-toothed, petals 3, anthers 6 or 10; *fruit* 3-celled, but not in all cases dehiscent.

Stamens 6 ... ...

Leaflets cordate and slightly oblique at the base, minutely rusty-tomentose beneath: flowers ·25 in. long ... 4. *A. rubiginosa.*

Leaflets sub-cuneate at the base, minutely puberulous and lepidote beneath; flowers less than ·1 in. long ... 5. *A. lanceolata.*

Leaflets sub-falcate and very oblique at the base, everywhere glabrous; flowers ·15 in. long, obovoid ... ... 6. *A. cucullata.*

Leaflets caudate-acuminate, the base rounded or cuneate, oblique, everywhere glabrous: flowers ·2 in. long, staminal tube cylindric ... ... 7. *A. Ridleyi.*

Stamens 10 ... ...

Panicles 12 to 20 in. long, cinereous-scurfy; leaflets with broad bases; flowers ·15 in. long ... 8. *A. Wallichii.*

Panicles 8 to 10 in. long, rusty-puberulous; leaflets narrowed at the base; flowers ·1 in. long ... ... 9. *A. rubescens.*

1. Amoora sumatrana, Miq. in Ann. Mus. Lugd. Bat. IV, 35. A tree 12 to 20 feet high; young branches stout, lenticellate, glabrous. *Leaves* 20 to 30 in. long, glabrous, unequally pinnate; leaflets 9 to 13, elliptic to elliptic-oblong, or oblanceolate-oblong, sub-coriaceous, shortly cuspidate, entire, the base more or less cuneate: main nerves 9 to 20 pairs, spreading; length 3 to 10 in., breadth 1·5 to 3·75 in. *Male flowers* ·15 in. long, obovoid, in solitary extra-axillary panicles nearly as long as the leaves, their branches 1·5 to 6 in. long, spreading or drooping: the flowers numerous but not crowded, each with a minute acuminate bracteole, the pedicels half as long as the flower, rather stout. *Sepals* 5, unequal, the two larger nearly half as long as the petals, rotund, the edges erose-fimbriate, the inner surface glabrous, the outer pubescent.

Petals 3, thick, rotund, very concave and much imbricate, glabrous inside, sometimes puberulous outside. *Staminal column* fleshy, globular-ovoid, obscurely 3-angled, the mouth almost closed; anthers 3, broadly elliptic, narrowed to the apex, shortly apiculate; rudimentary ovary minute, conical, on a small pubescent disc. *Female flowers* unknown; the fruit in simple spikes as long as or longer than the leaves, pinkish when ripe, shortly pedicellate, sub-globular, 3-celled, 3-seeded, dehiscent, about ·75 in. in diam.; the *seeds* ovoid, compressed, with a scarlet arillus. C. DC. Monogr. Phaner. I., 581.

Perak: Scortechini, Wray, King's Collector. Penang: Curtis, King. Distrib. Sumatra.

This species resembles *A. Rohituka*, W. and A., but it is a smaller tree, the male flowers have only 3 stamens, and the petals are pink. The Perak specimens agree with those in the Leiden Herbarium from Sumatra on which Miquel founded the species. Miquel in his description does not mention that the plant is triandrous,—a character by which it can at once be recognised.

2. Amoora Rohituka, W. and A. Prod. 119. A tree from 30 to 70 feet high; young branches stout, lenticellate, at first puberulous, afterwards glabrous. *Leaves* 1 to 3 feet long, unequally pinnate, the petioles puberulous; leaflets 9 to 15, sub-coriaceous, opposite, oblong to elliptic-oblong, shortly and bluntly acuminate, entire; the base narrowed, often oblique; both surfaces glabrous: main nerves 12 to 15 pairs, spreading; length 3 to 9 in., breadth 1·75 to 3·5 in., petiolule ·2 to ·3 in. *Male flowers* about ·15 in. long, sub-globular, in solitary axillary panicles more than half as long as the leaves, the branches about 3 in. long, spreading at right angles or slightly drooping; the flowers numerous, each with a minute scale-like bract, the pedicels short, stout. *Calyx* very short, spreading, with 5 or 6 small reniform sepals, pubescent. *Petals* 3, much larger than the calyx, orbicular, concave, glabrous or puberulous on the outer surface. *Staminal tube* nearly as long as the petals, sub-globular, with a small opening at the apex showing the slightly protruding apices of the anthers: *anthers* 6, sub-sessile, narrowly elliptic, attached to the tube near its base; rudimentary ovary ellipsoid, boldly 3-angled. *Female flowers* larger than the males, in axillary or slightly supra-axillary, solitary, often puberulous spikes much shorter than the leaves. *Sepals* sometimes more pubescent than in the male: petals as in the male, the anthers narrower. *Ovary* sub-globular or ellipsoid with a 3-lobed stigma: disc hypogynous, broadly conical, tawny-pubescent. *Fruit* sub-globular, yellow when ripe, 1 to 1·5 in. in diam.; the pericarp coriaceous, smooth, 3-celled, opening by 3 valves: *seed* oblong with a scarlet arillus. Hiern in Hook. fil. Fl.

Br. Ind. I, 559; C. DC. Monogr. Phan. I, 581; Kurz For. Flor. Burma I, 220; Trimen Flora Ceyl. I, 249; Bedd. Fl. Sylvat. t. 132; Brandis For. Fl. 69. *Andersonia Rohituka, Roxb. Hort. Beng.* 87; *Fl. Ind.* ii, 213. *Sphærosacme polystachya, Wall. Cat.* 1277. *Aglaia? polystachya, Wall. in Roxb. Fl. Ind. ed. Carey*, ii. 429. *S. spicata, Wall. Cat.* 4895. *Buchanania spicata, Hb. Roxb. ex Wall.* l. c. *Meliacea Wightiana Wall. Cat.* 4888. *Amoora macrophylla, Nimmo in Grah. Cat. Bomb. Pl.* 31. *Andersonia Rohitoca, Griff. Notul.* iv. 507; *Ic. Pl. Asiat.* iv. t. 589, f. 3.

Perak: not uncommon. Malacca; Griffith (Kew Distrib.) 1051; Maingay (Kew Distrib.) 341; King's Collector, many numbers. Andamans; King's Collector. Distrib. Sumatra; Forbes, No. 1734.

3. Amoora Aphanamixis, Schultes fil. Syst. VII, 1621, Phan. I, 581. A tree 20 to 30 feet high; young branches rusty puberulous, ultimately glabrous and (when dry) black. *Leaves* 15 to 25 in. long, unequally pinnate; leaflets 11 to 17, sub-coriaceous, oblong, oblong-obovate to elliptic, shortly and obtusely cuspidate; the base rounded, very unequal-sided; glabrous when adult; main nerves 10 to 12 pairs, slightly prominent beneath; length 4 to 6 or even 8 in., breadth 2 to 2·75 in.; petiolules stout, ·15 to ·25 in. long. *Panicles* slightly supra-axillary, shorter than the leaves, puberulous, those with male flowers with numerous short divaricating rather distantly-flowered racemose branches. *Flowers* on very short pedicels, sub-globose, about ·25 in. in diam. *Calyx* cupular, with 5 rounded imbricate sepals, thickened in the lower half and puberulous outside. *Petals* 3, thick, rotund, concave, much larger than the sepals, glaberulous. *Staminal tube* shorter than the petals, fleshy, glabrous, ovoid, with a small entire mouth; *anthers* 6, elliptic, included. *Ovary* depressed, 3-celled, glaberulous; stigma elongate, conical, fluted. *Female flowers* in rigid, unbranched or only slightly branched racemes, sessile like the males but with larger ovaries. *Fruit* ovoid-globose (ripe example not seen), glabrous. Miq. Fl. Ind. Bat. I, pt. 2. p. 535: Ann. Mus. Lugd. Bat. IV, 34. *Amoora grandifolia*, C. DC. Monogr. Phan. I, 581. *Aphanamixis grandifolia*, Bl. Bijdr. 165.

Under cultivation the leaves of this species often attain much greater size than the measurements given above.

4. Amoora rubiginosa, Hiern in Hook. fil. Fl. Br. Ind. I, 561. A tree 80 to 100 feet high; young branches stout, rusty-puberulous and scurfy. *Leaves* 18 to 24 in. long, equally pinnate; leaflets 8 to 10 pairs, opposite or alternate, coriaceous, oblong or elliptic-oblong, sub-acute or shortly acuminate, the base cordate and slightly oblique; upper surface glabrous, shining, the lower densely covered by minute rusty

tomentum with a few superficial stellate hairs; main nerves 20 to 24 pairs, spreading, prominent beneath; length 5 to 9 in., breadth 1·25 to 2·75 in.; petiolules about ·15 in. long, bent. *Panicles* solitary, axillary, more than half as long as the leaves, scurfily rusty-puberulous, the peduncles long, branches few with short racemose branchlets. *Flowers* on short pedicels, buds narrowly ovoid, ·25 in. long. *Calyx* shortly campanulate, rusty-tomentose outside, with 3 broad blunt spreading teeth. *Petals* 3, larger than the calyx, obovate-rotund, thick, glabrous. *Staminal tube* slightly shorter than the petals, narrowly ovoid, the mouth narrow and obscurely toothed; *anthers* 6, elliptic, included. *Ovary* broadly ovoid, depressed, 3-angled, tawny-pubescent, crowned by the glabrous ovoid, 6-angled stigma. *Fruit* sub-globose, apiculate, red when ripe, rusty-puberulous, 2 to 3 in. in diam., the pericarp pulpy. *Seeds* narrowly ellipsoid, about 1 in. long. C. DC. Monogr. Phan. I, 585. *Aphanamixis rubiginosa*, Griff. MSS.

Malacca, Griffith, No. 1050: Maingay, No. 340 (both of Kew Distrib.). Perak: King's Collector. Singapore, Ridley, No. 3790.

5. Amoora lanceolata, Hiern in Hook. fil. Fl. Br. Ind. I, 560. A tree; young shoots minutely rusty-puberulous. *Leaves* 6 to 10 in. long, unequally pinnate. *Leaflets* about 17, sub-coriaceous, opposite or nearly so, narrowly oblong-lanceolate, bluntly acuminate, entire, the base sub-cuneate; upper surface quite glabrous, the lower very minutely puberulous and lepidote; main nerves very faint, about 25 pairs, spreading; length 2 to 3 in., breadth ·6 to ·75 in., petiole ·2 in. *Panicles* of *male flowers* axillary, solitary, nearly as long as the leaves, the branches spreading, 1·25 to 2 in. long, many-flowered. *Male flowers* less than ·1 in. long, ovoid, on very short pubescent pedicels. *Calyx* cupular, with 3 shallow teeth, pubescent. *Corolla* much larger than the calyx; petals 3, concave, glabrous inside, puberulous outside. *Staminal tube* shorter than the *petals*, globular, glabrous, the mouth deeply 6-toothed; *anthers* 6, included, opposite the teeth, narrowly-elliptic; rudimentary. *Ovary* conical, 3-angled, puberulous. *Female flowers* and fruit unknown. C. DC. in Monogr. Phan. I, 584.

Malacca; Maingay (Kew Distrib.), No. 343.

6. Amoora cucullata, Roxb. Corom. Pl. III, 54, t. 258. A glabrous tree 30 to 40 feet high. *Leaves* 12 to 15 in. long, unequally pinnate; leaflets 5 to 9, thinly coriaceous, opposite, oblong-elliptic, sub-falcate, sub-acute, very oblique at the base: main nerves indistinct, numerous, spreading, the midrib strong; length 3 to 5 in., breadth 1·2 to 1·5 in., petiolule ·3 in. *Male panicles* about equal to the leaves, axillary, with lax, spreading, corymbiform, sparsely lepidote branches. *Flowers* ·15 in. long, obovoid. *Calyx* cupular, lepidote outside, with 3 broad blunt

teeth. *Petals* 3, longer than the calyx, glabrous, broadly elliptic, the apex blunt and concave. *Staminal tube* shorter than the petals, obovoid, its mouth with 6 shallow broad blunt erose teeth; *anthers* 6, elliptic, included, attached half-way up the tube; *rudimentary ovary* broadly ovoid, sub-truncate. *Female flowers* a little larger than the males, but in few-flowered supra-axillary racemes about 2 in. long; *Calyx*, corolla, staminal tube and anthers as in the male; ovary ovate, 3-angled, lepidote, 3-celled: stigma sessile, large, 3-lobed. *Fruit* depressed-globular, 2·5 in. in diam., dehiscing by 3 valves, the pericarp leathery. *Seeds* 3, rounded trigonous, with an orange-coloured arillus. Kurz For. Flora Burma I, 221; C. DC. Monogr. Phan. I, 583; Hiern in Hook. fil. Fl. Br. Ind. I, 560: Bedd. Fl. Sylv. 55; Miq. Ann. Mus. Lugd. Bat. IV, 37; Dalz. and Gibs. Fl. Bomb. 37. *Andersonia cucullata*, Roxb. Hort. Beng. 82; Fl. Ind. II, 212. *Sphaerosacme Rohituka*, Wall. Cat. 1278. *Amoora auriculata*, Miq. MSS.

Perak: Scortechini. Singapore: Ridley. Distrib. Borneo, Korthals: Burma, Khasia Hills, Delta of Ganges, Nepal.

7. Amoora Ridleyi, King n. sp. A tree 50 to 60 feet high; young branches stout, minutely cinereous-puberulous. *Leaves* 18 to 24 in. long, unequally pinnate; leaflets 11 to 17, sub-opposite or opposite, subcoriaceous, oblong-lanceolate to ovate-lanceolate, caudate-acuminate; the base rounded or cuneate, very unequal; both surfaces glabrous, the lower sub-glaucous; main nerves 8 to 13 pairs, spreading, slightly prominent on the lower surface: length 3·5 to 6 in., breadth 1·35 to 2 in., petiolules ·25 to ·4 in. *Panicles* axillary, solitary, about half as long as the leaves, stellate-pubescent, on long peduncles, much branched, the ultimate branchlets cymulose. *Flowers* ·2 in. long, narrowly ovoid, on bracteolate pedicels nearly as long as themselves. *Calyx* rather deeply cupular, tomentose outside, the mouth with 3 shallow broad teeth. *Petals* 3, longer than the calyx, fleshy, broadly elliptic, with very concave blunt apices, pubescent in the lower half outside, otherwise glabrous. *Staminal tube* much shorter than the *petals*, glabrous outside, with a few scattered hairs inside, cylindric, with a wide mouth with 6 broad shallow teeth; *anthers* 6, narrowly elliptic, their apices exserted; *ovary* depressed, densely pubescent, 3-celled; *stigma* glabrous, large, pyramidal, deeply grooved. *Fruit* globular, minutely rusty-tomentose, 2·5 in. in diam. when ripe, indehiscent, usually with 2 seeds 1·75 in. in length; peduncle, stout, ·5 in. long.

Perak: King's Collector, Nos. 5383, 5918, 6060, 7917; Wray, No. 2107. Pahang: Ridley, No. 5027.

8. Amoora Wallichii, King. A tree: young branches stout, minutely rusty-puberulous. *Leaves* 15 to 24 in. long, unequally pinnate:

leaflets 11 to 13, sub-coriaceous, opposite or sub-opposite, narrowly oblong, sub-acute, the base rounded or slightly cuneate, slightly oblique; both surfaces glabrous: main nerves 16 to 18 pairs, prominent on the rather pale under surface: length 4·5 to 8 in., breadth 1·4 to 2 in., petiolule ·5 in. *Panicles* solitary, axillary, nearly as long as the leaves, with few rather distant lax alternate branches, the ultimate branchlets cymulose and slightly scurfy. *Flowers* ·15 in. long, sub-rotund. *Calyx* a flattish cup with 3 broad shallow teeth, minutely tomentose externally. *Petals* 3, longer than the calyx, rotund, concave, much imbricate, minutely pubescent outside. *Staminal tube* spherical-obovoid, with 10 small acute teeth, glabrous; anthers 10, narrowly elliptic, their apices slightly exserted: rudimentary ovary depressed, tawny-pubescent, crowned by the thick fleshy 3-grooved stigma. *Female flowers* mixed with the males and exactly like them, but with a pyramidal, prominently 3-angled, tawny-pubescent, 3-celled ovary crowned by a stigma as in the male. *Fruit* obovoid, about 2 in. in diam., on a stout peduncle, its surface tawny-tomentose. *Sphaerosacme spectabilis*, Wall. MSS. in Herb. Calc. *Amoora spectabilis* Hiern (not of Miquel) in Hook. fil. Fl. Br. Ind. I, 561. Kurz For. Flora Burma I, 221.

Andaman Islands, King's Collectors. Distrib. Burma, Assam, Sikhim.

There has been some comfusion in dealing with this plant. The description above given is that of Wallich's own specimen (in flower) taken from a tree grown in the Bot. Gard., Calcutta, which had originally been brought from Goalpara in Assam. Fruiting specimens have in more recent years been collected in Assam by Mr. Gustav Mann, for many years Conservator of Forests in that province. Flowering specimens exactly agreeing with Wallich's have also been brought from the Andaman Islands. Miquel has described (Ann. Mus. Lugd. Bat. IV, 37) under the name *Amoora spectabilis*, a plant of which he says *Sphaerosacme spectabilis*, Wall. is the type. But Miquel's description does not fit Wallich's plant at all. Mr. Hiern, taking Miquel's name *A. spectabilis*, describes under it a plant from Burmah which is certainly not Miquel's plant: but which may be the same as *Sphaerosacme spectabilis*, Wall.

9. Amoora rubescens, Hiern in Hook. fil. Fl. Br. Ind. I, 561. A tree 30 to 40 feet high; young branches stout, rusty puberulous. *Leaves* 18 to 30 in. long: leaflets 13 to 15, opposite, thinly coriaceous, oblong, sub-acute or obtuse, narrowed and oblique at the base, both surfaces glabrous; main nerves 8 to 10 pairs, ascending, rather prominent beneath; length 4 to 5·5 in., breadth 1·75 to 2·25 in., petiolule ·5 in. *Panicles* solitary, axillary, 8 to 10 in. long, rusty puberulous, the

branches spreading, the ultimate branchlets 2- to 3-flowered. *Flowers* on short pedicels, obovoid-rotund, ·1 in. long. *Calyx* cupular, puberulous outside, with 3 broad blunt teeth. *Petals* 3, longer than the calyx, rotund, concave, slightly puberulous on the back and edges. *Staminal tube* broadly ovoid, the mouth wide and with 9 broad bifid teeth; *anthers* 10, elliptic, their apices exserted. *Ovary* depressed, tawny-pubescent, 3-celled: stigma large, cylindric, glabrous, sulcate. *Fruit* depressed-globular, mammillate, 2 in. in diam., minutely rusty puberulous, 3-celled (one cell abortive), pericarp thickly coriaceous, almost fleshy. C. DC. Monog. Phan. I, 589.

Singapore: Maingay Herb. prop. No. 3351 (Kew Distrib. No. 355). Perak: King's Collector, No. 5944; Wray, No. 2349. Penang: Curtis No. 2437.

The fruit when ripe is reddish-brown, according to Mr. Curtis.

7. Aglaia, Lour.

Trees or shrubs, glabrous, lepidote or stellately pubescent. *Leaves* pinnate or trifoliolate; leaflets quite entire. *Flowers* polygamo-dicœcious, minute or small, numerous, paniculate, sub-globose. *Calyx* 5-lobed, imbricated in bud. *Petals* 5, concave, short, imbricated. *Staminal tube* urceolate or sub-globose, 5-toothed at the apex or entire; anthers usually 5, or 4 or 10, included or half-exserted, erect. *Disk* inconspicuous. *Ovary* ovoid or shortly so, 1–3-celled, with 2–1 ovules in each cell; style glabrous, short. *Berry* dry, 1- 2-celled and-seeded. *Seeds* with a fleshy integument.—Distrib. Species about 70, Chinese, Indo-Malayan or Polynesian.

The genus *Aglaia* is distinguished by its small flowers with 5-merous calyx and corolla, and depressed-globose or globose staminal tube. The calyx-lobes are often imbricate, and the petals are invariably so, three being outside or partly so, and two entirely covered by the outer three. To the genus, as limited by M. C. de Candolle and Mr. Hiern, only species of which the anthers are either 5 or 6 can be admitted. The effect of this limitation as to the number of the anthers is to force into *Amoora* various species which, taking the section *Aphanamixis* as the type of *Amoora*, have far less in common with that genus than with the 5-antherous species of *Aglaia*. The result, as regards *Amoora*, is that that genus is loaded with a number of anomalous species collected together in a group under the sectional name *Pseudo-Aglaia*. By relaxing the definition of *Aglaia* so as to admit plants of which the flowers have 4, 8 or 10 stamens, and by limiting *Amoora* to plants with 3-merous corollas, it appears to me that both genera are greatly simplified. Dehiscence in the fruit cannot be regarded as a diagnostic character of *Amoora*, there being several Indian species in the fruit of which there is no evidence of dehiscence; but indehiscence in the fruit is an absolute character in *Aglaia*. The effect of the change which I have ventured to carry into effect in the diagnoses of these two genera is, as regards the species described by Mr. Hiern in the Flora of British

India, to convert *Amoora Maingayi* Hiern into an *Aglaia*: *Amoora dysoxyloides*, Kurz is also removed to this genus.

Stamens 4	1.	*A. fusca.*
Stamens 5		
Leaves quite glabrous, and not lepidote on the lower surface.		
Leaves trifoliolate, 2·5 to 3 in. long, often shorter than the panicles; calyx with elliptic lobes: anthers elliptic, included...	2.	*A. odorata.*
Leaves 3- to 5-foliolate, 5 to 9 in. long, always longer than the panicles; calyx with rounded teeth, puberulous outside; anthers broadly ovate and with the tips exserted...	3.	*A. oligophylla.*
Leaves 5 to 8 in. long; leaflets 5 or more; all parts of the flower glabrous	4.	*A. glabriflora.*
Leaves 7 or 8 in. long, leaflets 5 to 8, subglaucous beneath; sepals free, pubescent outside; flowers ovoid, ·1 in. long	5.	*A. glaucescens.*
Leaves 6 to 12 in. long, leaflets 7 to 9, the calyx toothed, lepidote-pubescent outside; flowers depressed-hemispheric, ·05 in. in diam.	6.	*A. Scortechinii.*
Leaves 12 to 24 in. long; leaflets about 15, brown when dry; calyx toothed, puberulous; flowers obovate, ·15 in. long	7.	*A. Ganggo.*
Leaves 18 to 36 in. long; leaflets 11 to 13, pale when dry; calyx puberulous; flowers ·05 to ·075 in. in diam., depressed-globular	8.	*A. leucophylla.*
Leaflets glabrous above, lepidote but not pubescent on the lower surface.		
Flowers depressed-globular, not more than ·04 in. in diam., on pedicels as long as or longer than themselves.		
Calyx with 4 or 5 long spreading unequal teeth nearly as long as the petals	9.	*A. cinerea.*
Calyx with 5 orbicular blunt spreading lobes much shorter than the petals ...	10.	*A. odoratissima.*
Flowers ovoid or obovoid-globose, ·05 in. or more in diam., on pedicels shorter than themselves.		

Flowers ovoid, ·08 in. long; calyx sub-campanulate, densely pubescent outside with 5 deep broadly ovate lobes; scales on under surface of leaflets minute and not shining ... ... 11. *A. Forbesii.*

Flowers ovoid, ·05 in. long; calyx cupular, pale-coloured, almost glabrous, divided to the base into 5 shallow broad blunt lobes; scales on lower surface of leaflets shining ... ... 12. *A. squamulosa.*

Flowers obovoid-globose, ·08 in. long; calyx with 5 broad shallow rounded spreading lobes minutely whitish tomentose with superficial stellate-hairy bright rusty scales; scales on lower surface of leaflets sparse stellate-hairy ... 13. *A. Kunstleri.*

Leaflets more or less glabrous on the upper, pubescent on the lower surface.

Panicles small with very short few-flowered branches ... ... 14. *A. humilis.*

Panicles condensed; flowers densely crowded, sessile.

Leaflets on the under surface covered with minute tomentum with stellate hairs intermixed, and with superficial shining scales; flowers sub-globular, petals orbicular ... . 15. *A. argentea.*

Leaflets as in *A. argentea*, petals elliptic, flowers ovoid ... ... 15. *A. argentea. var. Curtisii.*

Leaflets tomentose on the lower surface, scales if any not shining; petals elliptic, flowers ovoid ... ... 15. *A. argentea. var. eximia.*

Panicles not condensed, their main branches spreading, the ultimate divisions short densely flowered spikes; flowers depressed-globular, sessile.

Flowers ·1 in. in diam.,

Main nerves of leaves 28 to 36 pairs: panicles 9 to 12 in. long ... ... 16. *A. lanuginosa.*

Main nerves of leaves 16 to 24 pairs; panicles 6 to 8 in. long ... ... 17. *A. Curtisii.*

Flowers ·025 to ·4 in. in diam.
Calyx very tomentose and with 5 long narrow acute or sub-acute spreading unequal lobes some of them longer than the petals.
Leaves 4 to 9 in. long: leaflets not cordate at the base, 1·5 to 5 in. long; main nerves 6 to 11 pairs, spreading, fruit ellipsoid ... 18. *A. Palembanica.*
Leaves 7 to 15 in. long; leaflets minutely cordate at the base, 4 to 6 in. long; main nerves 10 to 14 in., oblique: fruit globular or ovoid ... 19. *A. cordata.*
Calyx much shorter than the petals and with broad short imbricate lobes.
Calyx quite glabrous ... ... 20. *A. Hiernii.*
Calyx pubescent outside; fruit pyriform, 1·75 in. long ... ... 21. *A. Griffithii.*
Panicles lax, spreading; flowers not crowded, depressed-globular, globular or obovoid, sub-sessile or pedicelled.
Flowers sub-sessile, anthers exserted.
Flowers ·035 in. in diam., depressed-globular, sub-sessile: calyx rotate and with 5 deep broad rounded membranous pubescent lobes: staminal tube short, cupular, sub-entire, glabrous. Fruit ovoid-globose, tapering into a pseudo-stalk, 1 in. long ... 22. *A. membranifolia.*
Flowers pedicelled, anthers included.
Flowers ·05 in. long, globular, on pedicels longer than themselves. Calyx cupular with 5 acute spreading teeth stellate-pubescent outside. Staminal tube globular, inflated about the middle, glabrous, the mouth sub-entire: fruit obovoid, rugulose, about ·4 in. long ... 23. *A. tenuicaulis.*
Flowers ·06 in. long, obovoid, on pedicels shorter than themselves; Calyx cupular, pubescent outside, with 5 blunt rotund spreading lobes; staminal

tube obovoid, 5-toothed, puberulous; fruit globular to ovoid, ·4 to ·6 in. long ... ... 24. *A. trichostemon.*

STAMENS 7 TO 9.

Panicles 12 in. long : calyx with 4 broad valvate unequal teeth ; stigma long, narrow, deeply 3-grooved, ovary 3-celled ... 25. *A. macrostigma.*

Panicles 2·5 to 6 in. long.

Calyx fleshy, pellucid-dotted, with 5 broad imbricate lobes : stigma thick, cylindric, 2-lobed ; ovary 2-celled ... 26. *A. heteroclita..*

Calyx with 5 minute erect pointed teeth : stigma capitate, 2- 3-angled ... 27. *A. andamanica.*

STAMENS 10 ... ... 28. *A. Maingayi.*

1. AGLAIA FUSCA, n. sp. King. A tree, young branches cinereous, at first covered with a thin layer of deciduous minute pale rusty scurfy tomentum, afterwards glaberulous. *Leaves* 6 to 10 in. long, equally or unequally pinnate ; leaflets coriaceous, alternate, sub-opposite (the upper pair opposite) oblong-lanceolate to ovate-lanceolate, shortly acuminate or acute, the base cuneate or sometimes rounded; upper surface glabrous and shining ; the lower glabrous, minutely punctulate, the midrib rusty-puberulous ; main nerves 7 to 9 pairs, ascending ; length 2·5 to 4·5 in., breadth 1 to 1·75 in. ; petiolules ·35 in., that of the odd leaf (when present) longer. *Panicles* axillary, solitary, much shorter than the leaves, with rather long peduncles, the branches few, the flowers rather crowded. *Flowers* globular, ·05 in. in diam., on pedicels rather shorter than themselves. *Calyx* of 4 unequal rotund sepals, scaly externally. *Petals* 4, rotund, concave, glabrous, larger than the sepals. *Staminal tube* globular-obovoid, much thickened inside below each anther, glabrous, the mouth small annular, sub-entire ; *anthers* 4, shortly and thickly ovate, inserted near the mouth. *Ovary* (rudimentary) pubescent ; *stigma* long, cylindric, glabrous. *Fruit* globular with a small apiculus, minutely rusty-tomentose, ·3 in. in diam. (not ripe), one-celled and one-seeded by abortion.

South Andaman : King's Collector.

In the fruit distinct remains of a second cell are found. The species is closely allied to *A. fuscescens*, but is distinguishable by its thicker narrower leaflets with midribs hairy below, much smaller flowers, and more globose staminal tube which appears never to have more than 4 anthers. Flowers with perfect pistils have not yet been found.

2. AGLAIA ODORATA, Lour. Fl. Coch. Chin. 173. A shrub or small tree ; young shoots slender, rusty stellate-lepidote. *Leaves* trifoliolate, 2·5 to 5 in. long ; leaflets thinly coriaceous, ovate- or obovate-oblong, the

apex obtuse or tapered to each end or sub-rhomboidal: the terminal one the largest and tapering into the petiole: both surfaces glabrous, minutely reticulate when dry: main nerves 6 to 8 pairs, curving, indistinct; length of lateral pair 1·25 to 2 in., of terminal one 2·5 to 3·5 in. *Panicles* often longer than the leaves, lax. *Flowers* ·1 in. long, on pedicels of about the same length, glabrous. *Calyx* with 5 deep elliptic lobes. *Petals* unequal, orbicular or sub-orbicular. *Staminal tube* campanulate, with 5 broad truncate teeth; *anthers* 5, elliptic, included. *Fruit* unknown.

Malacca, Penang and Singapore; but probably only cultivated. Distrib. China and Siam.

3. Aglaia oligophylla, Miq. Fl. Ind. Bat. Suppl. 507. A small tree 15 to 20 feet high: young branches covered with deciduous cinereous scurf. *Leaves* 5 to 9 in. long, unequally pinnate, the petioles and rachises puberulous, soon becoming glabrous; leaflets 3 to 5, membranous, the pairs opposite, the terminal one the largest, obovate-oblong to elliptic, shortly and often bluntly acuminate, the base cuneate, sometimes oblique: both surfaces glabrous, reticulate when dry; main nerves 5 or 6 pairs, ascending, curving; length 3 to 6 in., breadth 1·5 to 2·5 in.; petiolules ·4 to ·5 in., swollen at the base. *Panicles* axillary, 1·5 to 4 in. long, at first scurfy, but ultimately sub-glabrous, much branched, bracteolate. *Flowers* ·075 in., in diam., on slender pedicels as long as themselves, globular. *Calyx* cupular, flat, with 5 spreading rounded concave teeth, puberulous externally, the edges ciliolate. *Petals* much longer than the calyx, orbicular, concave, glabrous. *Staminal tube* shorter than the petals, globular-turbinate, 5-grooved, the mouth with 5 broad blunt teeth; *anthers* 5, broadly ovate, the tips only exserted. *Ovary* depressed; *stigma* conical, pubescent. *Fruit* globular, with the calyx persistent at its base, densely and minutely tawny-pubescent, ·5 or ·6 in. in diam.; the pedicels stout, glabrous ·1 in. long. Kurz For. Flora Burma I, 220; C. DC. Monogr. Phaner. I, 607; Miq. Ann. Mus. Lugd. Bat. IV, 41. *Meliaceae Singapuriana ?* *Walsura* Wall. Cat. 4887.

Singapore: Wallich. Perak: King's Collector, No. 3968. Distrib. Burmah, Helfer (Kew Distrib.), No. 1046. Sumatra.

4. Aglaia glabriflora, Hiern in Hook. fil. Fl. Br. Ind. 1. 555. A glabrous tree 15 to 25 feet high. *Leaves* 5 to 8 in. long, unequally pinnate, the petioles and rachises angled: leaflets about 8 opposite and one odd, membranous, usually ovate, rarely lanceolate, bluntly acuminate, the base cuneate, rarely rounded; when dry the upper surface shining, the lower dull; main nerves 4 pairs, ascending, curving, obsolete on the upper, slightly prominent on the lower surface; length 2 to 2·75 in., breadth ·75 to 1·25 in., petiolules ·15 to ·2 in. *Panicles* solitary, axillary, spreading, 1·5 to 4 in. long. *Flowers* numerous, ·1 in. long, their

pedicels usually shorter but sometimes longer than themselves. *Calyx* cupular, fleshy, with 5 broad shallow rounded teeth. *Petals* 5, much longer than the calyx, ovate, concave, the edges thin. *Staminal tube* shorter than the petals, urceolate, the edge sub-entire; *anthers* 5, elliptic, subcordate, deeply included. *Ovary* short, depressed, pubescent; *stigma* long, cylindric, glabrous. *Fruit* reniform, compressed, cinerous, puberulous, 2-celled, 2-seeded, ·6 in. in diam. C. DC. Monogr. Phaner. I, 608.

Malacca: Griffith, Nos. 1041, 1042. Maingay (Kew Distrib.) No. 336. Perak: King's Collector, Nos. 10617, 10724. Scortechini, No. 482. Singapore: Ridley, Nos. 1812, 3898.

5. Aglaia glaucescens, n. sp. King. A shrub: young branches rather slender, the bark when dry cinereous lenticellate; while young covered with pale rusty minute scurfy tomentum. *Leaves* 7 or 8 in. long, equally or unequally pinnate: leaflets 5 to 8, thinly coriaceous, oblong or elliptic-oblong or obovate-oblong, sub-acute, the base cuneate, both surfaces glabrous, the upper shining, the lower dull and sub-glaucous; main nerves 8 to 10 pairs, ascending, rather straight, slightly prominent on the lower surface; length 3·5 to 5·5 in., breadth 1·75 to 2 in. (rarely 3 in.), petiolules ·35 to ·5 in. *Panicles* solitary, axillary, nearly as long as the leaves, branching from near the base, very lax, few-flowered. *Flowers* ovoid, ·1 in., long, on pedicels about as long as themselves. *Calyx* of 4 or 5 ovate concave ascending sepals, pubescent externally. *Petals* 4 or 5, larger than the sepals, thick, elliptic, obtuse, glabrous. *Staminal tube* nearly as long as the petals, cylindric, widening at the sub-entire mouth; *anthers* 4 or 5, shortly and broadly ovate, attached near the apex of the tube, included. *Ovary* shortly and narrowly cylindric, pubescent, crowned by the glabrous cylindric stigma. *Fruit* unknown.

South Andaman Island: King's Collectors.

6. Aglaia Scortechinii, King, n. sp. A tree; young shoots slender and, like the slender petioles, rachises, petiolules and inflorescences, with very minute brown scales. *Leaves* 6 to 12 in. long, unequally pinnate; leaflets 7 to 9, the pairs opposite, membranous, lanceolate or oblong-lanceolate, shortly acuminate, much cuneate at the base; both surfaces quite glabrous, pale brown when dry; the 7 to 10 pairs of main nerves indistinct; length 3·5 to 5 in. *Panicles* 7 to 9 in., the branches long, divaricating, lax. *Flowers* depressed-hemispheric, ·05 in. in diam., on slender pedicels longer than themselves. *Calyx* short, spreading, with 5 deep orbicular concave lobes, lepidote-pubescent externally. *Petals* 5, orbicular or ovate-orbicular, concave, glabrous, much larger than the calyx. *Staminal tube* shorter than the petals, widely depressed-campanulate, the mouth with several broad much inflexed teeth, glabrous;

anthers 5, elliptic, included. *Ovary* small, depressed; *stigma* globose. *Fruit* unknown.

Perak: Scortechini, No. 722.

The nearest ally of this is *A. speciosa*, Blume, which, however, has leaflets of thicker texture, with more numerous and distinct nerves and squamulose on the under surface. The flowers of the two also differ slightly, those of *A. speciosa*, although similar in calyx and corolla, having a staminal tube with a wide open mouth, without inflexed teeth and from which the anthers are partly exserted.

7. Aglaia Ganggo, Miq. Flor. Ind. Bat. Suppl. 506. A tree: young branches, petioles, midribs and inflorescences covered with minute rusty scales. *Leaves* 10 to 24 in. long, equally or unequally pinnate; leaflets 10 to 15, opposite or alternate, sub-coriaceous, narrowly oblong or oblong-lanceolate, shortly and rather abruptly acuminate; the base cuneate, unequal-sided: both surfaces free from hairs, but covered with very minute scale-like pustules: main nerves 12 to 18 pairs, faint, spreading: length 3 to 5·5 in., breadth 1 to 1·75 in., petiolule ·15 to ·35 in. *Panicles* solitary, axillary, nearly as long as the leaves, the lower branches distant, all more or less spreading, the flowers on the ultimate branchlets rather crowded. *Flowers* ·1 to ·15 in. long, ovoid, sub-sessile. *Calyx* cupular, minutely pubescent and scaly outside, the mouth with 5 broad blunt erect teeth. *Petals* 5, larger than the calyx, elliptic, concave, blunt, glabrous. *Staminal tube* shorter than the petals, ovoid, the mouth small, circular, not toothed; *anthers* 5, narrowly elliptic, included. *Ovary* small, depressed, 3-angled, densely hairy, crowned by the glabrous cylindric grooved stigma. *Fruits* on short stout pedicels, reniform, compressed, 2-celled, 2-seeded, minutely rusty-lepidote, ·5 in. broad (perhaps not quite ripe). Miq. Ann. Mus. Lugd. Bat. IV, 47. C. DC. Phaner. Monogr. I, 27.

South Andaman, Nicobar Islands; King's Collector. Distrib. Sumatra.

The flowers of the Andaman specimens agree exactly with those from Sumatra on which Miquel founded the species which is a very distinct one. On each panicle, there appear to be certain flowers with perfect and others with imperfect ovaries. The panicles bearing fruit are thus in size and ramification exactly like those bearing flowers. *A. Forsteni*, a species founded by Miquel (Ann. Mus. Lugd. Bat. IV, 46) on specimens collected in Amboina does not appear to me to be really distinct from this. Under the name of *Aglaia Ganggo*, Miq., I believe there have been issued from the Calcutta Herbarium some specimens of a Perak plant (King's Collector, No. 4606), which much resembles this in leaves and inflorescence, but which has a very different staminal tube.

8. Aglaia leucophylla, King, n. sp. A tree 40 to 60 feet high; all parts quite glabrous; young branches rather stout, pale, cinereous when dry and slightly rough. *Leaves* 2 to 3 feet long, unequally pinnate; the petioles very long, minutely rugulose when dry; leaflets 11 to 13, membranous, the lower alternate and distant, the upper opposite, oblong-lanceolate to elliptic-oblong or ovate, all with acuminate apices and cuneate bases, the lower half sometimes very narrow; main nerves 9 to 15 pairs, spreading, curving, invisible on the upper but distinct on the lower surface; length 6 to 12 in., breadth 1·25 to 3 in.; petiolules ·25 to ·6 in., slender. *Panicles* extra-axillary, slender, rugulose, the branches spreading but slightly. *Flowers* ·05 to ·075 in. in diam., depressed-globular, on pedicels longer than themselves. *Calyx* much smaller than the petals, pale-coloured, puberulous, with 5 deep acute or sub-acute spreading lobes. *Petals* 5, dark-coloured when dry (yellow when fresh), orbicular, concave, glabrous. *Staminal tube* turbinate, the mouth 5- or 6-lobed; *anthers* 5 or 6, broadly ovate, the connective slightly apiculate at the apex, the apices bent downwards and not exserted. *Ovary* broad, depressed, pubescent: *stigma* broadly ovoid, the apex sub-2-lobed. *Fruit* (not ripe), obovoid, with depressed sub-bi-lobed apex; the slightly enlarged calyx persistent at the base, minutely cinereous, tomentose.

Perak: King's Collector, Nos. 1874, 2998 and 6494. Wray, No. 2935.

There is some diversity in the size of the leaflets and of the flowers of this species. My collector's gathering No. 2998 above-quoted has narrowly oblong-lanceolate leaflets, and its flowers measure scarcely ·05 in diam.: while the flowers of No. 1874 are quite ·075 in. in diam., and the leaflets of all the other gatherings, except No. 2998, are either elliptic-oblong or ovate. I find that the structure of the flowers is alike whatever their size may be.

9. Aglaia cinerea, King, n. sp. A shrub 10 to 15 feet high: young branches petioles, rachises, petiolules and inflorescences with numerous minute brown scales. *Leaves* 7 to 12 in. long, unequally pinnate: leaflets 5 to 7, alternate and rather distant; the uppermost pair opposite, thinly coriaceous, oblong- or ovate-lanceolate, often oblique, the apex shortly acuminate, the base cuneate, that of the upper three much narrowed in the lower third; both surfaces cinereous when dry, the lower paler and sparsely covered with rusty stellate scales; main nerves 8 to 13 pairs, oblique, rather straight; length 2·5 to 6 in., breadth 1 to 1·75 in.; petiolules ·35 to ·6 in., that of the odd leaflet sometimes ·8 in. *Panicles* supra-axillary, slender, lax, 5 to 7 in. long, the branches divaricating. *Flowers* small, ·04 in. in diam., globu-

lar, on slender pedicels longer than themselves. *Calyx* with 4 or 5 long spreading unequal blunt lobes nearly as long as the petals, pubescent-lepidote externally. *Petals* 5, concave, rotund, unequal, glabrous. *Staminal tube* shorter than the petals, shortly campanulate with a truncate entire mouth, glabrous: *anthers* 5, shortly ovate, exserted. *Ovary* and stigma both depressed. *Fruit* pyriform with a long pseudo-stalk and on a short stout pedicel, minutely pubescent-lepidote, ·75 in. long, and ·4 in. diam. near the apex.

Malacca: Griffith. Perak: King's Collector, Nos. 2730 and 5285. Scortechini No. 347.

10. Aglaia odoratissima. Blume Bijdr. 171. A tree 20 to 40 feet high: young branches petioles rachises petiolules and inflorescences with minute brown deciduous scales. *Leaves* 5 to 9 in. long, unequally pinnate; leaflets 5 to 7, oblong-lanceolate, rarely ovate, opposite, thinly coriaceous, shortly acuminate, the base cuneate or rounded; upper surface glabrous, greenish when dry, the lower brown, sparsely (the midrib and nerves rather densely) lepidote; main nerves 6 to 9 (rarely 11) pairs, ascending, curved; length 2 to 5 (occasionally 7) in.,; breadth 1 to 2 (occasionally 2·5) in.; petiolules ·2 in., that of the terminal one sometimes ·3 in., *Panicles* supra-axillary, solitary, 3 to 8 in. long, (occasionally 10 to 12) in., the branches divaricating, densely-flowered. *Flowers* depressed-globular, about ·035 in. in diam., on pedicels about as long. *Calyx* cupular, or rather flat, short, with 5 orbicular blunt spreading lobes, pubescent-lepidote outside. *Petals* 5, much longer than the calyx, elliptic or obovate-rotund, unequal, blunt, concave, glabrous, sometimes granular outside. *Staminal tube* shorter than the petals, truncate-campanulate, the mouth open, obscurely 5-lobed: *anthers* broadly ovoid, inserted by a very short filament just below the mouth of the tube, exserted, or inflexed and therefore included. *Ovary* small, depressed, pubescent; *stigma* small, broadly ovoid. *Fruit* ovoid or sub-globose, densely covered with minute brown scales, about ·6 in. long, and ·4 in. in diam., usually 1-seeded. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 544; Ann. Mus. Lugd. Bat. IV. 44. C. DC. Monogr. Phaner. I, 602. *A. Roxburghiana* Hiern, Fl. Br. Ind. I, 555 and C DC. Monogr. Phaner. I, 604. (*not of Miquel.*) Aglaia? Wall. Cat. 9039 ? A. sexipetala, Griff. Notulæ I, 505.

Malacca; Griffith 1036; Maingay (Kew Dist.), No. 337. Perak: Scortechini, Wray, King's Collector. Singapore: Ridley. Penang: Curtis Nos. 662, 768, 895, 896, 2448. Distrib. Sumatra, Java.

Although resembling *A. Roxburghiana*, Miq. in its calyx and corolla, that has a different staminal tube to which the strictly included more elliptic anthers are attached near the base, whereas the anthers of

this species are shortly and broadly triangular ovoid and are inserted on the staminal tube close to its mouth. The fruits too are different.

11. Aglaia Forbesii, King, n. sp. A tree 40 to 80 feet high: young branches slender and, like the angled petioles rachises and petiolules, densely and minutely rufous-tomentose. *Leaves* 12 to 15 in. long, equally pinnate; leaflets 8 to 10, membranous, alternate, rather distant, oblong to elliptic, alternate (the upper pair usually opposite) cuspidate, the base slightly cuneate; upper surface olivaceous when dry, glabrous, minutely rugulose, dull; the lower rather pale brown, minutely scurfy: main nerves 10 to 13 pairs, oblique, rather straight, faint on the upper, bold on the lower surface: length 3·5 to 5·2 in., breadth 1·5 to 2·5 in. *Panicles* axillary, solitary, densely stellate-tomentose, 4·5 to 9 in. long, the branches spreading. *Flowers* numerous, ·08 in. long, ovoid, on pedicels shorter than themselves. *Calyx* sub-campanulate, densely pubescent outside, glabrous inside, with 5 deep broadly ovate lobes. *Petals* 5, twice as long as the calyx, orbicular or ovate-orbicular, concave, glabrous. *Staminal tube* shorter than the petals, turbinate-globular, the mouth with 5 broad shallow erose teeth, glabrous; *anthers* 5, ovate, included or with their apices exserted. *Ovary* small, depressed, puberulous; *stigma* large, fleshy, broadly ovoid. *Fruit* ellipsoid to ovoid, sometimes slightly gibbous at the base, or narrowly obovoid, not apiculate, pale yellow when ripe, covered with minute scurfy pubescence, 1 to 1·25 in. long, and ·7 to ·9 in. in diam. when dry; the pedicel short, stout.

Perak: Wray, No. 3265: King's Collector, Nos. 4762 and 10787. Pangkore: Curtis, No. 1631. Distrib. Sumatra, H. O. Forbes, No. 3179.

12. Aglaia squamulosa, King, n. sp. A tree 30 to 50 feet high: young branches rather stout, the bark striate and densely covered with minute brown scurf-like pubescence. *Leaves* 15 to 30 in., unequally pinnate, petiole rachis and petiolules minutely squamulose-pubescent: *leaflets* 11 to 15, distant, alternate except the upper pair which are opposite, coriaceous; both surfaces minutely rugulose when dry, the upper glabrous and dull, the lower uniformly covered with shining minute pale-edged scales: main nerves 10 to 12 pairs, oblique, little curved, faint on the upper, bold on the lower surface: length 4 to 10 in., breadth 1·75 to 3·5 in., petiolules ·25 to ·6 in. *Panicles* axillary, solitary, much branched, spreading, squamulose, angled, many-flowered, 10 to 12 in. long. *Flowers* ovoid, ·05 in. long, on pedicels shorter than themselves. *Calyx* cupular, pale-coloured, almost glabrous, divided to the base into 5 shallow broad blunt lobes. *Petals* 5, much longer than the calyx, dark-coloured, rotund, unequal, concave, glabrous. *Staminal tube* shorter than the petals, globose, the mouth

entire: *anthers* 5, ovate, large. *Ovary* rather large, pubescent, extending much beyond the base of the ovoid glabrous stigma. *Fruit* (very young) narrowly elliptic, densely scaly like the under surface of the leaflets.

Perak: King's Collector, Nos. 8805, 11013, 10145.

In its leaves this resembles *A. latifolia* Miq., but the scales on the under surface of this are much larger and more shining. The flowers too of this are much smaller and the calyx and corolla differ.

13. Aglaia kunstleri, King, n. sp. A tree 30 to 40 feet high; young branches rather stout and, like the petioles, rachises, petiolules and inflorescences, covered with minute deciduous, brown pubescence and scales. *Leaves* 18 to 25 in. long, unequally pinnate; leaflets 5 to 13, coriaceous, oblong-oblanceolate to elliptic-oblong, the apices shortly acuminate, the bases usually more or less oblique, rounded or cuneate, the upper leaflets often much narrowed in the lower third: upper surface glabrous, pale green, and minutely rugulose when dry, the lower paler, rugulose, and with sparse, stellate, hairy, minute brown scales: main nerves 10 to 14 pairs, faint on the upper, and only slightly prominent on the lower surface: length 4·5 to 7·5 in., breadth 1·75 to 2·75 in. *Panicles* solitary, axillary, branching, many-flowered, 3 to 9 in. long. *Flowers* ·08 in. long, globular-obovoid, on pedicels shorter than themselves. *Calyx* cupular, tapering to the pedicel, with 5 broad blunt spreading shallow lobes, minutely whitish-tomentose with bright rusty superficial stellate-hairy scales. *Petals* 5, much larger than the calyx, broadly elliptic, concave, blunt. *Staminal tube* dark-coloured, pale and scarious towards the base, shorter than the petals, globose, glabrous, 5-lobed; *anthers* 5, broadly ovate, included. *Ovary* rusty-pubescent; *stigma* thick, short, conical. *Fruit* globular, slightly depressed at base and apex, densely covered with minute pale buff-coloured hairs, about ·8 in. in diam. when dry, pedicel very short.

Perak: King's Collector, Nos. 5287, 10610.

14. Aglaia humilis, n. sp. King. A shrub or small tree; young branches stout, rusty puberulous, the bark dark-coloured. *Leaves* 18 to 26 in. long, unequally pinnate; *leaflets* sub-opposite (the upper pair opposite), thinly coriaceous, oblong to elliptic-oblong, rarely ovate, shortly cuspidate, the base rounded or sub-cuneate; both surfaces minutely punctulate when dry, the upper glabrous except the puberulous midrib; the lower glabrous, the midrib and nerves stellate-pubescent; main nerves 11 to 20 pairs, spreading, prominent on the lower, depressed on the upper surface when dry; length 4 to 9 in., breadth 1·75 to 3·5 in.; petiolules ·25 to ·6 in. *Panicles* supra-axillary, solitary, 3 to 6 in. long, with few-flowered very short branches. *Flowers* globular, ·05 in. in

diam. *Calyx* campanulate, pubescent-lepidote outside, the mouth with 5 large rounded teeth. *Petals* 5, longer than the calyx, elliptic, glabrous. *Staminal tube* shorter than the petals, obovoid-globose, glabrous, the mouth with 5 shallow broad blunt teeth; anthers 5, ovate-ellipsoid, included, short. *Ovary* rather broad, pubescent, with a large glabrous conical 2-lobed stigma. *Fruit* (young) globular-obovoid, 2-celled; the pericarp fleshy, cinereous-pubescent externally.

Perak: King's Collector, No. 8619; Wray, No. 3763.

15. Aglaia argentea, Blume Bijdr. 170. A slender tree 10 to 15 or 20 feet high; young shoots, petioles, rachises, petiolules, inflorescences and under surfaces of the leaves densely covered with a layer of minute tomentum with many stellate hairs and flat shining white or pale-brown scales intermixed and on the surface. *Leaves* 24 to 30 in. long, unequally pinnate; leaflets 7 to 11, alternate, the odd one and the upper pairs often much the largest, thinly coriaceous, oblong-lanceolate to ovate-lanceolate or elliptic, the odd leaflet and often also the upper pair often much cuneate at the base, the lower pairs often rounded, occasionally minutely cordate and sub-sessile, the apices of all more or less acuminate: upper surface glabrous, the lower shining silvery to pale brown; main nerves 12 to 24 pairs, inconspicuous on the upper bold and prominent on the lower surface; length of the lower leaflets 5 to 9 in., of the terminal one 12 to 15 in., breadth 2 to 5 in., petiolules ·2 in. *Panicles* supra-axillary, pedunculate, spreading, very dense, 3 to 5 in. long. *Flowers* crowded, numerous, sessile, sub-globular, ·08 in. in diam., *Calyx* half as long as the corolla, deeply divided into 5 broad rounded imbricate concave lobes, furfuraceous-lepidote externally, glabrous internally. *Petals* 5, concave, orbicular, glabrous. *Staminal tube* globular, shorter than the petals, the mouth sub-entire; *anthers* 5, ovate, included. *Ovary* depressed; *stigma* sub-cylindric, truncate, glabrous. *Fruit* ovoid or obovoid, minutely rusty-pubescent and lepidote, ·8 to 1·25 in. long, Miq. Flor. Ind. Bat. Vol. 1, Pt. 2, 543; Ann. Mus. Lugd. Bat. IV, 54; Kurz For. Flor. Burma I, 219; C. DC. Monogr. Phaner. I, 618. *A. hypoleuca*, Miq. Ind. Bat. Suppl. 507. *A speciosa*, Teysm, and Binn. Cat. Hort. Bogor. 211 (not of Blume). *Milnea argentea*, Reinw. in Cat. Hort. Bogor. 71.

Perak: King's Collector, No. 3135. Nicobar Islands, Kurz.—Distrib. Burma, Sumatra, Java, New Guinea.

This is a widely distributed and variable species of which Miquel (Ann. Mus. Lugd. Bat. IV, 55) enumerates no less than seven varieties, most of which he had himself previously treated as species. In young shoots the leaflets are often few but very large.

Var. *eximia*, Miq. Ann. Mus. Lugd. Bat. IV, 55. *Flowers* ovoid;

petals elliptic, staminal tube ovoid; leaflets 15 to 25, oblong, opposite, sub-sessile, the bases rounded, 3 to 6 in. long, the terminal one not longer than the pairs but with a narrow base: under-surfaces from pale to cinnamoneous, not shining. *A. eximia*, Miq. Fl. Ind. Bat. Suppl. 506. *A. ancolana* Miq. l. c. 506.

Perak: King's Collector, Nos. 5767 and 10007. Distrib. Sumatra.

Var. *Curtisii*, King. *Flowers* ovoid, ·15 in. long: *petals* elliptic; *staminal tube* globular, the apical aperture very small and almost entire. *Leaflets* 15 to 19, oblong, shortly acuminate and with rounded bases, the terminal one not larger than the others. *Fruit* narrowly pyriform, densely lepidote.

Penang; Curtis, No. 2287. Perak: King's Collector, No. 8239.

16. Aglaia lanuginosa, King, n. sp. A tree 50 to 70 feet high; young branches very stout (1 in. in diam.), rugulose and rusty-tomentose between the large triangular leaf-cicatrices. *Leaves* 2 to 4 feet long, unequally pinnate everywhere, except on the upper surfaces of the leaflets, densely covered with soft rusty stellate tomentum; leaflets 9 to 13, the pairs opposite, thinly coriaceous, oblong, cuspidate, the base rounded and often minutely cordate; upper surface glabrous; main nerves 28 to 36 pairs, sub-horizontal, slightly prominent on the lower, faintly depressed on the upper surface; length 5 to 15 in., breadth 2 to 3·5 in., petiolules ·25 to ·4 in. *Panicles* axillary, from 9 to 12 in. long, stout; branches few, ascending and bearing short lateral spikes. *Flowers* sessile, densely crowded, depressed-globular, about ·1 in. in diam. *Calyx* completely enveloping the petals, with 5 deep narrow lobes covered outside with soft stellate wool, inside glabrous. *Petals* 5, elliptic, blunt, glabrous, concave, slightly shorter than the calyx. *Staminal tube* shorter than the petals, its mouth wide and deeply 5-lobed, glabrous; *anthers* opposite its lobes, large, included. *Ovary* small; *stigma* cylindric. *Fruit* unknown.

Perak: Scortechini, No. 1682; King's Collector, Nos. 7381, 7714.

This species resembles the Bornean *A. grandis*, Miq. in its leaves, but has different flowers. *Fruit* of both species is unknown.

17. Aglaia Curtisii, King, n. sp. A tree 60 to 80 feet high; young branches stout, rusty puberulous. *Leaves* 18 to 30 in. long, unequally pinnate; leaflets coriaceous, 11 to 15, sub-opposite, oblong to elliptic, shortly acuminate; the bases of the lower rounded, of the upper cuneate; upper surface glaberulous and when dry minutely pustulate, the midrib puberulous; under surface covered with dense minute rusty tomentum with numerous stellate hairs on the surface; main nerves 16 to 24, spreading, prominent beneath; length 6 to 9 in., breadth 2 to 4 in., petiolules ·2 to ·35 in. *Panicles* slightly supra-axillary, solitary, 6

to 8 in. long, with few sub-erect branches; the branchlets short, densely flowered, all scurfy puberulous. *Flowers* globose, sessile, more than ·1 in in diam. *Calyx* of 4 or 5 thick densely tomentose sub-rotund sepals. *Petals* 5, glabrous. *Staminal tube* short, sub-globular, with a wide mouth; *anthers* 5, short, attached close to the mouth of the tube, their apices included. *Fruit* globular-obovoid, minutely rusty puberulous, 1·5 in. long, and 1·25 in. in diam.

Pangkore: Curtis, No. 1627. Perak; King's Collector, No. 7786.

A species allied to *A. pachyphylla*, Miq., and not easy by description alone to be distinguished from that species. An examination of Miquel's type specimen of *A. pachyphylla* kindly lent to me by the authorities of the Leiden Herbarium shows that the leaves of that are distinctly falcate, while those of this are not: moreover the leaves of *A. pachyphylla* taper much more to the apex, and the panicles are more robust, than is the case in this species. The tomentum on the under surface of the leaves differs in character in the two species; and in the leaves of *A. pachyphylla* the midribs of the leaves are raised and ridge-like on the upper surface, while these of this species are depressed. The fruit of *A. pachyphylla* is unknown.

18. Aglaia Palembanica, Miq. Flor. Ind. Bat., Suppl. 507. A tree 10 to 25 feet high; young shoots, petioles and rachises, petiolules and inflorescense densely rusty stellate-tomentose. *Leaves* 4 to 9 in. long, unequally pinnate; *leaflets* 5 to 9, sub-opposite, membranous, oblong-lanceolate to ovate, opposite or sub-opposite, shortly acuminate, the base cuneate, the terminal and upper pairs of leaflets with bases much narrowed; upper surface sometimes deciduously lepidote, ultimately glabrous, except sometimes the pubescent lower half of the midrib; lower surface more or less closely stellate-pubescent, especially on the midrib and 6 to 11 pairs of spreading main nerves; length 1·5 to 5 in., breadth ·65 to 1·75 in., petiolules ·15 in. *Panicles* solitary, axillary, 1·5 to 4 in. long, slender, their branches short and divaricating, bearing the flowers in dense short spikes. *Flowers* depressed-globular, about ·025 in. in diam. *Calyx* with 5 long narrow acute or sub-acute spreading unequal lobes, some of them occasionally longer than the petals, boldly stellate-tomentose outside, glabrous inside. *Petals* 5, obovate-elliptic, concave, glabrous. *Staminal tube* shorter than the petals, glabrous, its mouth truncate entire; anthers 5, ovate, curved, half-exserted. *Ovary* large, pubescent, stigma 3-angled. *Fruit* ellipsoid (narrowly so when young), deciduously stellate-tomentose, ·75 in. long, and ·6 in. in diam. Miq. Ann. Mus. Lugd. Bat. IV., 52; Hiern in Hook. fil. Fl. Br. Ind. I, 557; C. DC. Monogr. Phaner. I, 619. *Aglaia Sipannas*, Miq. Fl. Ind. Bat. Suppl. 508. *A. tomentosa*, Teysm. and Binn. in Nat. Tijdschr. Ned.

Ind. Vol. 27. p. 43. *A. rufa*, Miq. in Ann. Mus. Lugd. Bat. IV, 649. C. DC. Monogr. Phaner. I, 613.

Malacca: Griffith, No. 1043. Maingay (Kew Distrib.), No. 333. Penang: Curtis, No. 2003; King's Collector, No. 1790. Perak: Scortechini, Wray, King's Collector. Kedah: Curtis, No. 2520. DISTRIBUTION: Sumatra, Bangka, Borneo.

This differs from its nearest ally *A. Griffithii* in its large, irregularly lobed, very tomentose calyx, and in its smaller fruit and leaves. I have examined authentic specimens of *A. Sipannas*, Miq. and of *A. rufa*, Miq., and I cannot see how they are to be separated from *A. palembanica*, Miq. A specimen in the Leiden Herbarium, collected by Korthals in Sumatra, and named in Miquel's handwriting *A. elliptica*, Blume, var. *Sumatra*, ought in my opinion to be referred to this species. The plant named by Teysmann and Binnindyk *A. tomentosa*, and of which Curtis's specimen from Kedah, No. 2520, is an example, has longer leaflets than typical *A. palembanica*, with more nerves, and more tomentose beneath; but I think its reduction to this is justifiable. This plant has a wider distribution than is usual with species of this family, and slight local differences are thus naturally to be expected.

19. AGLAIA CORDATA, Hiern in Hook. fil. Fl. Br. Ind. I, 557 (excl. var. 2). A tree 20 to 30 feet high; young shoots, petioles, rachises, petiolules and inflorescence more or less densely clothed with rusty or tawny stellate-tomentum. *Leaves* 7 to 15 in. long, unequally pinnate; leaflets 7 to 9, the pairs opposite, rarely sub-opposite, membranous, oblong-oblanceolate, rarely ovate or elliptic, all with shortly acuminate apices, the odd one the largest and much attenuate towards the base, the paired leaflets cuneate, minutely cordate at the very base; upper surface glabrous, the midrib slightly pubescent; the lower stellate-pubescent, sometimes densely so, the midrib always, and the nerves usually, tomentose; main nerves 10 to 14 pairs, oblique, slightly depressed on the upper surface when dry and prominent on the lower: length 4 to 6 in., breadth 1·75 to 2·25 in., petiolules less than ·1 in. or absent; the terminal leaflet larger and with a petiolule ·2 to ·4 in. long. *Panicles* axillary, solitary, 3 to 6 in. long, the branches spreading, the ultimate branchlets shorter, spike-like, and densely crowded with flowers. *Flowers* about ·35 in. in diam., sub-sessile, otherwise as in those of *A. palembanica*. *Fruit* globular or ovoid, densely covered with deciduous rusty stellate tomentum, ·5 to ·65 in. in diam. C. DC. in Monogr. Phaner. I, 618 (excl. var. b. *calyce glabro*).

Malacca: Maingay (Kew Distrib.), Nos. 334, 335/2. Singapore: Ridley, No. 333. Perak: Scortechini; Wray, No. 2962; King's Collector, Nos. 2836, 3646, 5071, 6360.

Under his species *A. cordata*, Mr. Hiern has in my opinion included two plants. The species *A. cordata*, as here limited, includes only Hiern's form with hirsute calyx, and is really little more than a large-leaved variety of *A. palembanica*. Mr. Hiern's form with glabrous calyx is, in my opinion, a distinct species, the calyx differing not only in being glabrous, but in being much smaller, and of quite a different shape. I have described it as a species under the name *A. Hiernii*.

20. Aglaia Hiernii, King, n. sp. A tree 40 to 80 feet high; young branches, petioles, rachises, petiolules and inflorescences, densely clothed with rather soft rusty stellate tomentum. *Leaves* 14 to 18 in. long, unequally pinnate; leaflets 7 to 9, the pairs opposite, thickly membranous, oblong or oblong-lanceolate; the terminal one oblong-oblanceolate, longer than the others and two or three times as long as the petiolule; the apices of all shortly and sharply acuminate, the bases cuneate, especially of the uppermost ones; upper surface glabrescent with a few scattered stellate-hairs, the midrib and nerves densely stellate-pubescent; under-surface uniformly covered with pale-brown-centred scales and a superficial layer of rufous stellate tomentum; main nerves 13 to 22 pairs, sub-horizontal, depressed on the upper and bold on the lower surface when dry; length 4 to 6 in. (the odd one an inch longer); breadth 1·75 to 2·25 in., petiolules of the pairs ·15 in. *Panicles* slightly supra-axillary, solitary, 8 to 12 in. long, the branches divaricating, the ultimate branchlets bearing densely-flowered spikes. *Flowers* ·4 in. long, sessile, globular. *Calyx* cupular, quite glabrous, with 4 or 5 deep broad rounded imbricate lobes. *Petals* 5, rotund or ovate-rotund, unequal, much longer than the calyx, the outer 3 the largest, all concave and glabrous. *Staminal tube* shorter than the petals, cup-shaped, the mouth wide; the 5 ovate *anthers* inserted by very short filaments on the edge of the tube, but inflexed so as to be included. *Ovary* small, pubescent; *stigma* depressed-spheroidal, pubescent. *Fruit* unknown.

Malacca: Maingay. Perak: King's Collector, Nos. 5976, 6706, 10877.

This is allied to *A. cordata*, Hiern, but differs from it in having leaflets with more numerous and more horizontal main nerves, more densely tomentose and lepidote beneath. The calyx of this, moreover, is conspicuously different, being smaller, having broad lobes much shorter than the petals, and quite glabrous, while the calyx of *A. cordata*, as limited here, has a large calyx densely stellate-tomentose externally, and with acute lobes often longer than the petals. This is a large tree, often attaining a height of 80 feet, while *A. cordata* is a small tree from 20 to 30 feet high.

21. Aglaia Griffithii, Kurz in Journ. As. Soc. Bengal, for 1875, p. 146. A tree 30 to 50 feet high; young branches petioles, rachises, petiolules and inflorescences densely clothed with minute rusty stellate pubescence. *Leaves* 12 to 18 in. long, unequally pinnate; leaflets 13 to 19, opposite or sub-opposite, narrowly elliptic or oblong-lanceolate, often slightly oblanceolate, shortly acuminate, the base rounded or sub-cuneate: upper surface glabrous except the rusty tomentose midrib, the nerves inconspicuous; lower surface sparsely stellate-pubescent, the midrib and 10 to 12 pairs of bold curved spreading nerves tomentose; length 2·5 to 5 or even 6 in., breadth 1 to 1·4 in., petiolules about ·15 in. *Panicles* solitary, axillary, spreading, many-branched, many-flowered. *Flowers* about ·025 in. in diam., depressed-globular, broader than long. *Calyx* cupular with 5 deep broad lobes, pubescent outside. *Petals* 5, twice as long as the calyx, concave, glabrous. *Staminal tube* shorter than the petals, glabrous; *anthers* 5, ovate, partly exserted. *Ovary* pubescent; *stigma* depressed-hemispheric. *Fruit* pyriform, densely covered with sub-deciduous rusty scurfy stellate tomentum, 1·75 in. long, and 1·25 in. in diam. Kurz For. Flora Burma I, 219. *A. minutiflora* Bedd. var. *Griffithii*, Hiern in Hook. fil. Fl. Br. Ind. I, 557: C. DC. in Phaner. Monogr. I, 616.

Malacca: Griffith, Nos. 1039 and 1040: Maingay, No. 334-2 (No. 334 is *A. cordata*, Hiern). Perak: Scortechini, Wray, King's Collector, Nos. 4231, 6282, 6341, 6346, 10285, 10925, 10957.

The flowers of this are less than half the size of those of *A. minutiflora* Bedd.—a plant of Western Peninsular India, of which Mr. Hiern and M. C. De Candolle make this a variety. On dissecting male flowers of an authentic specimen of Beddome's plant I find, however, that not only are the flowers larger, but they are of a different shape, being globular-obovoid, while those of this plant are depressed-globular and broader than long. The calyx of this, moreover, is about half as long as the petals, while the calyx of Beddome's plant is not more than a third or a fourth of the length of its petals. Moreover, the leaflets of *A. minutiflora* Bedd., are less numerous than in this plant, and the tomentum on their lower surface is much more dense. The fruit hitherto described as belonging to this plant, is that issued from Kew as No. 334 of Maingay's Herbarium. That fruit, however, does not belong to this species, but to *A. cordata*, Maing. It is globular and, in size as well as in shape, greatly resembles that of *A. minutiflora*. The true fruit of this (now described for the first time) is pyriform and much larger than that of *A. minutiflora*. On account of these differences, I therefore follow Kurz in regarding this as a distinct species from the latter.

22. Aglaia membranifolia, King, n. sp. A tree 20 to 60 feet high,

Leaves 2 to 3 feet long, the petioles, rachises and petiolules covered with minute harsh tomentum, unequally pinnate; leaflets from 7 to 11, thinly membranous, elliptic-oblong, acuminate, the base cuneate; upper surface glabrous, pale greenish when dry, the lower surface darker and sometimes with a tinge of purple, very sparsely and minutely stellate-pubescent, the midrib boldly so; main nerves 20 to 30 pairs, faint on the upper, bold on the lower surface; length 9 to 15 in., breadth 2·75 to 5·5 in., petiolules only about ·1 in. *Panicles* everywhere stellately rusty-pubescent, slightly supra-axillary, with numerous, many-flowered, spreading branches. *Flowers* about ·035 in. in diam., depressed-globular, almost sessile, often with a few bracteoles at the base. *Calyx* rotate, with 5 deep broad rounded membranous pubescent lobes. *Petals* 5, broadly ovate to rotund, longer than the calyx, glabrous, concave. *Staminal tube* shorter than the petals, cupular, sub-entire, glabrous; *anthers* 5, ovate, curved, exserted. *Ovary* small, much depressed; *stigma* depressed-spheroidal, vertically grooved. *Fruit* ovoid or ovoid-globose, tapering at the base into a short pseudo-stalk, densely covered with minute scaly tawny tomentum, 1 in. long, and ·75 in. in diam.

Perak: King's Collector, Nos. 5901 and 7104. DISTRIBUTION: Sumatra; Forbes, No. 1679.

This resembles *A. tenuicaulis*, Hiern; but it has smaller flowers, different calyx and staminal tube and larger fruit. The texture of the leaflets is also thinner and the stellate hairs on their under surface less numerous.

23. AGLAIA TENUICAULIS, Hiern in Hook. fil. Fl. Br. Ind. I, 556. A shrub or small tree 10 or 12 feet high with a slender stem 2 to 3 in. in diam. *Leaves* 3 feet or more in length, unequally pinnate; the long petiole, rachises, petiolules and young branches densely stellate rusty-tomentose; leaflets membranous, oblong to elliptic, minutely cuspidate to shortly acuminate; the base cuneate, rarely rounded; upper surface glabrous, the lower sparsely minutely stellately rufous-pubescent; main nerves 15 to 20 pairs, spreading, obsolete on the upper prominent on the lower surface; length 6 to 12 in., breadth 2·5 to 4·5 in.; petiolules ·3 to ·35 in., stout. *Panicles* slightly supra-axillary, everywhere densely rufous-pubescent like the petioles, about 12 in. long, with spreading densely-flowered branches, those bearing fruit only a few inches long. *Flowers* ·05 in. long, globular, on pedicels longer than themselves. *Calyx* cupular, stellate-pubescent outside, glabrous inside, with 5 deep acute spreading teeth. *Petals* 5, much longer than the calyx, ovate or sub-obovate, concave, elliptic, glabrous. *Staminal tube* shorter than the petals, globular, inflated about the middle of the sub-entire mouth, glabrous except at the base inside; *anthers* 5, short, ovate, included. *Ovary*

small, stellate-hairy. *Stigma* elliptic, obtuse. *Fruit* obovoid, rugulose, densely covered with minute rusty stellate-tomentum, about ·4 in. long, C. DC. in Monogr. Phaner. I, 615.

Penang: Maingay (Kew Distrib.), No. 3252. Curtis, No. 747. Selangor; Ridley. Perak; Wray, King's Collector, Scortechini. Singapore; Lobb. Distrib. Sumatra.

24. Aglaia trichostemon, C. DC. Monogr. Phaner. I, 608. A tree 30 to 60 feet high; young shoots, petioles and rachises of leaves and inflorescences deciduously rusty stellate-tomentose, scabroid beneath the tomentum. *Leaves* 18 to 27 in. long, unequally pinnate; leaflets 9 to 13, alternate or opposite, sub-coriaceous, oblong to elliptic, shortly acuminate, the base slightly cuneate or rounded; upper surface glabrous, the lower sparsely and minutely stellately pubescent; main nerves 12 to 16 pairs, slightly depressed on the upper surface when dry, bold on the lower; length 4 to 8 in.; breadth 2 to 2·75 in.; petiolules ·25 to ·4 in. *Panicles* supra-axillary, solitary, nearly as long as the leaves, with few divaricating lax branches, densely and minutely rusty stellulate-pubescent and scaly. *Flowers* obovoid, globose, ·06 in. long, on pubescent pedicels shorter than themselves. *Calyx* shallow, cupular, deeply divided into 5 rotund, blunt, spreading lobes, pubescent externally. *Petals* 5, slightly unequal, ovate-rotund, concave, glabrous, much longer than the calyx. *Staminal tube* shorter than the petals, thin, puberulous, obovate, the mouth with 5 broad emarginate shallow teeth; *anthers* 5, broadly ovate, small, inserted near the edge of the tube, included. *Disc* rather large, inferior to the ovary, pubescent. *Ovary* small, cylindric, 4-angled, glabrous. *Fruit* globular to ovoid, shortly pedicelled, densely covered with minute rusty stellate tomentum, ·4 to ·6 in. long. *Cupania rufescens*, Wall. Cat. 8067 *B* (exclude A). *Aglaia edulis*, Hiern in Hook. fil. Fl. Br. Ind. I, 1556. *Aglaia cupanioidea*, King MSS.

Penang; Wallich. Perak; Scortechini, King's Collector, Nos. 5597, 5901. Pahang; Ridley, No. 5885. Singapore, Anderson, No. 29; Ridley, No. 5833. Malacca; Derry, Nos. 1076, 1186. Distribution Borneo, Beccari, No. 3981.

Although first collected so long ago as Wallich's time, fruit of this very distinct species is now described for the first time. It resembles *A. tenuicaulis* and *A. membranifolia* to some extent in its leaves, but is a much larger tree than either, and its leaflets have a thicker texture. Its fruits are much smaller than those of *A. membranifolia;* and, although of about the same size as those of *A. tenuicaulis*, they are covered with much shorter tomentum. Specimens of this were distributed from the Calcutta Herbarium under the MSS. name *Aglaia cupanioidea*, King MSS.

25. Aglaia macrostigma, King, n. sp. A tree 40 to 60 feet high; young branches very stout, lenticellate, puberulous. *Leaves* 2·5 to 4 feet long, unequally pinnate, the petioles very long, ·3 in. thick, and, like the rachises petiolules and inflorescence, covered with minute brown scales; leaflets 15 to 17, the pairs opposite or nearly so, membranous, elliptic to elliptic-oblong, slightly oblique, shortly and sharply acuminate, the base rounded; upper surface everywhere glabrous, the lower glabrous, the midrib and nerves rugulose and minutely scaly: main nerves 12 to 20 pairs, depressed on the upper surface, very prominent on the lower; length 5 to 10 in., breadth 2 to 4 in., petiolules ·5 to ·7 in. *Panicles* axillary, solitary, about 12 in. long (including the long peduncle), the branches rather short, many-flowered. *Flowers* broadly obovoid, about ·08 in. long, on short stout rusty-tomentose pedicels. *Calyx* half as long as the corolla, cup-shaped, the mouth with 4 unequal broad valvate teeth, rusty-stellate-tomentose externally. *Petals* 5, glabrous, imbricate, the two external longer and orbicular, the 3 inner smaller and elliptic. *Staminal tube* shorter than the petals, cupular, the mouth wide and with 8 to 10 lanceolate teeth; *anthers* 7 or 8, large, elliptic, much exserted. *Ovary* depressed, 3 angled, 3-celled, yellowish-pubescent, crowned by a glabrous erect fleshy deeply-fluted 3-angled stigma. *Fruit* elliptic-obovoid, narrowed to a short pseudo-stalk, covered with minute pale scales, 1·5 in. long, and 1 in. in diam.

Perak: King's Collector, Nos. 6531, 6919, 7559.

Like *A. heteroclita*, King, this species has more than 5 stamens, and it has a larger stigma than is usually found in *Aglaia*. Its inflorescence is quite that of *Aglaia*, as also is its fruit.

26. Aglaia heteroclita, King, n. sp. A tree 30 to 40 feet high, glabrous except the inflorescence and under surfaces of the leaves. *Leaves* 18 to 30 in. long, equally or unequally pinnate: leaflets thinly coriaceous, 8 or 9 to 10 or 11, distant, alternate, oblong to elliptic-oblong, oblique, more or less acuminate, the base cuneate and oblique: both surfaces dull and pale when dry (especially the lower), the upper glabrous, the lower with sparse minute rusty stellate scales; main nerves 12 to 16 pairs, spreading, faint on the upper, and only slightly conspicuous on the lower surface; length 4 to 7 in., breadth 1·5 to 2·75 in.; petiolules ·35 to ·75 in., slender. *Panicles* axillary or terminal, 2·5 to 6 in. long, stout, the branches not divaricating, the ultimate branchlets minutely bracteolate, densely flowered. *Flowers* ·125 in. long, sub-globular, on thick pedicels shorter than themselves and with a spongy epidermis. *Calyx* fleshy, corrugated, conspicuously pellucid-dotted, deeply divided into 5 broad rounded imbricated concave lobes. *Petals* 5, somewhat longer than the calyx and thinner, not dotted, ellip-

tic, blunt, concave especially towards the apex. *Staminal tube* shorter than the petals and darker in colour, globular-cylindric, the mouth obscurely lobed. *Anthers* 7 or 8, elliptic, included. *Ovary* pyramidal, fleshy, grooved, pubescent, 2-celled, crowned by the glabrous, broadly and shortly cylindric, grooved, indistinctly 2-lobed stigma. *Ovules* 2 in each cell, superposed. *Fruit* obovoid or pyriform, shortly apiculate, minutely scaly-tomentose, about 1 in. long including the pseudo-stalk, and ·8 in. in diam., apparently indehiscent, 1- or 2-seeded.

Perak; King's Collector, No. 10896, Wray (at elevation of 3400 ft.), Nos. 1135, 3994. Distrib. Sumatra, Forbes, Nos. 1558 and 1696.

This differs from typical *Aglaia* in having 7 or 8 stamens, and its stigma is that of *Amoora* rather than of *Aglaia*. The inflorescence resembles that of *Aglaia argentea*, Bl.

27. Aglaia andamanica, Hiern in Hook. fil. Fl. Br. Ind. I, 218. A tree 30 to 40 feet high; young branches, petioles, midribs, inflorescence and calyx covered with pale-brownish deciduous scales. *Leaves* 12 to 15 in. long, unequally pinnate; leaflets 5 to 7, alternate, membranous, ovate-elliptic to elliptic, shortly and obtusely acuminate, the base rounded or sub-cuneate, slightly oblique; main nerves 13 to 15 pairs, faint; upper surface glabrous, shining; the lower dull, sparsely scaly; main nerves 13 to 16 pairs, oblique, slightly prominent below; length 4 to 6 in., breadth 2 to 3 in., petiolule ·25 to ·35 in. *Panicles* crowded towards the ends of the branches, axillary, solitary, 2 to 3 in. long, many-flowered. *Flowers* broadly ovoid, truncate, ·15 in. long, on pedicels shorter than themselves. *Calyx* cupular, puberulous and scaly outside, the mouth with 5 pointed minute erect teeth. *Petals* 5, larger than the calyx, elliptic, slightly obovate, the apex blunt and incurved, puberulous externally, the edges membranous and glabrous. *Staminal tube* ovoid-globose, the apex sub-truncate, with 4 obscure broad teeth; *anthers* 8 or 9, narrowly elliptic, sessile, inserted at the base of the tube, included. *Ovary* small, depressed, 3-angled, densely tawny-tomentose; *stigma* sub-capitate, glabrous, fleshy, 2–3-angled. *Fruit* narrowly ellipsoid, lepidote, 1·5 in. long. Kurz For. Flora Burma. I, 218. C. DC. Monogr. Phaner. I, 606. *Amoora dysoxyloides*, Kurz Journ. As. Soc. Bengal II, 1875, p. 200; I, 222. C. DC. l. c. I, 589.

The Andaman and Nicobar Islands; Kurz, King's Collectors. Distrib. Great Coco Island, Prain. Burma, Brandis.

Kurz described his *Amoora dysoxyloides* on scanty specimens collected by Sir Dietrich Brandis in Burma. I have carefully dissected flowers from these and I find they are those of an *Aglaia*, and belong to *A. andamanica*, Hiern.

28. Aglaia Maingayi, King, n. sp. A shrub? young branches, thin,

with pale bark and minute brown scales. *Leaves* 4 to 6 in. long; *leaflets* 4 or 5, alternate or opposite, membranous, oblong-elliptic, shortly and bluntly acuminate, the base cuneate, both surfaces glabrous; main nerves 6 to 9 pairs, ascending, faint; length 2·5 to 3·5 in.; breadth 1·15 to 1·5 in., petiolule ·25 in. *Panicles* one or two from an axil, shorter than the leaves, slender, much branched, scaly. *Flowers* on pedicels as long as themselves, depressed-globular, ·15 in. in diam. *Calyx* widely cupular, pubescent and scaly outside, with 4 or 5 broad shallow erect unequal teeth. *Petals* 4 or 5, larger than the calyx, obovate, the upper half concave, glabrous or puberulous, attached by their bases to the staminal tube. *Staminal tube* depressed-globose, the mouth wide and obscurely toothed, puberulous below the anthers inside; *anthers* 10, half as long as the tube, ovate, included. *Ovary* minute, depressed, pubescent, 3-celled, 3-ovuled; *stigma* short, cylindric, glabrous. *Fruit* (young) broadly obovoid, deeply 3-grooved, puberulous, 3-celled, with a single seed in each cell. *Aglaia Maingayi*, Hiern in Hook. fil. Fl. Br. Ind. I, 562. C. DC. Monogr. Phaner. I, 588.

Malacca: Maingay (Kew Distrib.), No. 342 (Herb. prop. No. 1910). Perak: King's Collector, No. 3325, Scortechini.

Doubtful Species.

A tree has been collected in Perak both by Mr. Wray and Mr. Kunstler (Collector of the Calcutta Botanic Garden), which I believe to be *Aglaia Korthalsii*, Miq. The Perak specimens are in fruit only; and it is only by comparison with Miquel's type specimen of *A. Korthalsii* in the Leiden Herbarium (which is in flower only), that I have made the identification. The species closely resembles *A. macrostigma*, King, but has shorter leaves with more slender rachises and petiolules: the fruit is also larger and more obovoid. I have distributed the Perak plant as doubtfully *A. Korthalsii*, but not having flowers, I do not describe it here.

8. Lansium, Rumph.

Trees with unequally pinnate leaves; the leaflets quite entire, alternate or opposite, shortly petiolulate. *Flowers* polygamo-dicœcious, 5-merous, axillary, the male usually paniculate, the female spicate-racemose. *Sepals* rounded, imbricated. *Petals* rounded, connivent, concave, imbricated. *Staminal tube* globose, the mouth entire or crenulated; *anthers* 10, obtuse, usually in two rows, the shorter ones included, the longer partly exserted, sometimes apiculate. *Disk* obsolete. *Ovary* globose, 3–5-celled; cells 1-2-ovuled; *style* very short, thick; *stigma* truncate, 3–5-lobed. *Fruit* baccate, edible, 1–5-celled, *cells*

1-2-seeded; *seeds* oblong, invested in a pulpy aril, exalbuminous.—Distrib. Four species, all Indo-Malayan.

Leaflets 5 to 10 in. long; main nerves about 10 pairs	1. *L. domesticum.*
Leaflets 2 to 3 in. long: main nerves very numerous	2. *L. cinereum.*
Doubtful species	3. *L. pedicellatum.*

1. Lansium domesticum, Jack in Trans. Linn. Soc. XIV, 115, t. IV. f. 1. A tree 30 to 50 feet high; young branches with pale glabrous lenticellate bark. *Leaves* 12 to 18 in. long; leaflets 5 to 7, alternate, coriaceous, oblong-elliptic, sometimes slightly obovate, abruptly shortly and obtusely acuminate, narrowed and slightly unequal at the base; both surfaces shining, reticulate, glabrous or slightly puberulous toward the base; main nerves about 10 pairs, ascending, curved, depressed on the upper, prominent on the lower surface when dry; length 5 to 10 in., breadth 2·75 to 4 in., petiolules ·5 in.; the terminal 1 in., jointed. *Hermaphrodite spikes* from the trunk and larger branches, solitary or in fascicles, pubescent, much shorter than the leaves. *Flowers* sessile or on very short pubescent pedicels, solitary, minutely bracteolate at the base. *Calyx* fleshy, puberulous, with 5 shallow rounded teeth. *Petals* longer than the calyx, sub-rotund, glabrous. *Staminal tube* sub-globose, the mouth sub-entire, truncate, shorter than the petals, the stamens in a single row. *Ovary* sub-globular, tomentose, 5-celled; *style* short, thick, 10-furrowed; *stigma* large, discoid. *Berry* oblong-ovate to obovoid, sub-tomentose, 1 to 1·5 in. long; *seeds* usually about 2, embedded in much transparent pulp. Correa de Serra in Ann. Mus. X, 157, t. 7, fig. 1; Blume Bijdr. 165; A. Juss. Mem. Mel. 81; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 545; Hiern in Hook. fil. Fl. Br. Ind. I, 558; C. De Cand. Monogr. Phaner. I, 598.

Malacca: Griffith, Maingay (Kew Distrib.), No. 338. Perak: Wray, King's Collector, common. Cultivated in all the Provinces, except the Andamans and Nicobars, on account of its edible fruit. Distrib. The Malayan Archipelago.

There are several varieties of this which have been by some authors regarded as species, *e.g.*, *L. aqueum*, Jack, *L. humile*, Hassk.

2. Lansium cinereum, Hiern in Hook. fil. Fl. Br. Ind. I, 558. A tree; young branches tawny-pubescent at first, afterwards cinereous. *Leaves* 3 to 5 in. long, unequally pinnate; leaflets 3 to 5, opposite, sub-coriaceous, elliptic-oblong, obtusely cuspidate, the base acute; both surfaces quite glabrous, pale when dry; main nerves very numerous, obscure; length 2 to 3 in., breadth ·8 to 1·5 in., petiolules ·1 to ·25 in. *Spikes* nearly as long as the leaves, glabrous. *Flowers* hermaphrodite.

Calyx cupular, puberulous, with 5 obscure rounded teeth. *Petals* obovate, glabrous. *Anthers* oblong, mucronate. *Ovary* globose, pubescent, 5-celled, longer than the glabrous style. *Fruit* unknown. C. DC. Monogr. Phaner. I, 598.

Malacca: Maingay (Kew Distrib.), No. 339.

Known only by Maingay's scanty specimens.

3. Lansium pedicellatum, Hiern in Hook. fil. Fl. Br. Ind. I, 558. A tree; young branches pale brown, scaly. *Leaves* 9 to 12 in. long, unequally pinnate; leaflets 3 to 5, alternate or sub-opposite, thinly coriaceous, elliptic, shortly and sharply acuminate; the base oblique, obtuse or cuneate; both surfaces glabrous; main nerves 8 to 10 pairs, ascending, spreading, slightly prominent beneath; length 3 to 6 in., breadth 1·5 to 2·5 in., petiolules ·15 to ·25 in. *Male flowers and inflorescence* unknown. *Racemes of female flowers* 1 to 2 in. long, axillary, sometimes with a branch at the base; flowers on pedicels ·1 to ·15 in. long. *Ovary* minutely tomentose, 4-celled; *stigma* sessile. *Young fruit* sub-globose, fleshy, shortly tomentose.

Malacca: Maingay (Kew Distrib.), No. 356.

The above description is drawn up from the only two specimens which I have seen, and from Hiern's and De Candolle's descriptions. There is nothing in it to connect the species absolutely with *Lansium*, the genus in which its author has placed it.

9. Walsura, Roxb.

Trees. *Leaves* 1–9-foliolate; leaflets opposite, entire, pale beneath. *Panicles* axillary and terminal; *Flowers* small, hermaphrodite. *Calyx* short, 5-fid or -partite, the lobes spreading, imbricated in bud. *Petals* 5, ovate-oblong, spreading, slightly imbricated or sub-valvate. *Filaments* 10 or 8, linear or flattened, free or connate in a tube; *anthers* terminal or inserted in the notch at the apex of the filament. *Disk* usually annular, fleshy. *Ovary* short, 2–3-celled, imbedded in the disk, style rather short; *stigma* turbinate-capitate, 2-3-dentate; *Ovules* 2 in each cell. *Fruit* baccate, shortly tomentose, indehiscent, 1- rarely 2-celled and -seeded; *seed* inclosed in a fleshy aril, exalbuminous. Distrib. about 12 species, Indo-Malayan.

Filaments united near the base.

Leaflets 5 to 9, with 5 or 6 pairs of main lateral nerves ... ... 1. *W. multijuga.*

Leaflets not more than 5, with 8 to 10 pairs of main lateral nerves.

Stigma discoid, fruit not apiculate 2. *W. neurodes.*

Stigma conical, with a large swollen annulus round its base; fruit apiculate ... ... 3. *W. Candollei.*

Filaments quite free.

Leaflets five, 5 to 7 in. long, glaucous beneath, flowers ·15 in. long ... 4. *W. hypoleuca.*

Leaflets three to five, 3 to 5 in. long, not glaucous; flowers ·25 in. long ... 5. *W. robusta.*

1. Walsura multijuga, King n. sp. A tree 20 to 30 feet high: young branches cinereous, puberulous, not lenticellate. *Leaves* 5 to 9 in. long, rachis puberulous; leaflets 5 to 9, coriaceous, lanceolate or oblong-lanceolate, shortly acuminate, usually much narrowed but sometimes rounded and oblique at the base; both surfaces glabrous, the lower paler; main nerves 5 or 6 pairs, ascending, curved, slightly prominent on the lower surface: length 2·5 to 5 in., breadth ·75 to 1·5 in., rarely 2 in., petiolules ·15 to ·2 in., the terminal ·4 or ·5 in. *Panicles* small, umbellate-cymose, pedunculate, much shorter than the leaves, clustered in the axils of the leaves or terminal, puberulous; the peduncles 1 to 2 in. long, the heads about 1 in. in diam. *Flowers* about ·1 in. long, their pedicels shorter. *Calyx-teeth* short, broad, spreading. *Petals* 5, broadly elliptic, blunt, puberulous outside, longer than the calyx. *Stamens* 10, shorter than the petals; the filaments slightly united into a tube in the lower third, the upper two-thirds free, flattened, bifid at the apex, glabrous outside, pubescent inside below the anthers. *Anthers* small, ovate, inserted between the divaricating incurved teeth of the filaments. *Disc* proper, none. *Ovary* broadly obovoid or ovoid-globular, tapering into the very short style, glabrous; *stigma* small, capitate with a central mammilla. *Fruit* ovoid or ovoid-globose, apiculate, densely rusty-tomentose, ·5 in. long without the apiculus. *Melospermum rubro-stamineum*, Scort. MS. in Herb. Calc.

Perak: Scortechini, Wray, King's Collector, very common. Distrib. Sumatra, Upper Burma.

2. Walsura neurodes, Hiern in Hook. fil. Fl. Br. Ind. I, 564. A tree; young branches cinereous-puberulous. *Leaves* 6 to 8 in. long; leaflets 5, narrowly elliptic or elliptic-oblong, shortly and bluntly acuminate, the base cuneate or rounded; upper surface glabrous, shining, the lower glaucous; main nerves 8 to 10 pairs, spreading, rather prominent beneath; length 2 to 4 in., breadth 1 to 2 in., petiolule ·25 to ·35 in., the terminal one 1 in. *Panicles* equal to or longer than the leaves, on rather long peduncles, their lateral branches lax, short, the flowers near their apices and not numerous. *Flowers* ·15 in. long, pedicels shorter. *Calyx* with 5 short broad ovate spreading teeth. *Petals*

5, broadly elliptic, blunt, glabrescent inside, puberulous outside. *Stamens* 10, shorter than the petals; the filaments flattened, pubescent, faintly united in their lower third but easily separable, inserted outside the annular entire glabrous disc. *Ovary* pubescent, surrounded by the disc, ovoid-conic, tapering into the thick glabrous style; *stigma* discoid, small. *Fruit* ovoid or ovoid-rotund, minutely puberulous, not apiculate, about ·65 in. long. C. DC. Monogr. Phaner. I, 636.

Malacca: Maingay (Kew Distrib.), Nos. 344 and 345. Griffith, No. 1057 (Kew Distrib.). Perak: Wray, No. 3798.

3. Walsura Candollei, King, n. sp. A small tree; young branches glabrous, lenticellate, dark-coloured when dry. *Leaves* 4 to 7 in. long, unequally pinnate; leaflets usually 5, membranous, lanceolate, sub-acute, the base rounded; both surfaces glabrous, the lower pale, sub-glaucous; main nerves 7 to 11 pairs, spreading, curving; length 2 to 4 in., breadth ·75 to 1·2 in., petiolules ·2 to ·4 in. *Panicles* puberulous, crowded towards the ends of the branches, axillary, on slender pedicels 2 to 3 in. long, corymbosely cymose, about 1·5 in. across. *Flowers* ·1 in. long, sub-globular, on pedicels about as long as themselves. *Calyx* of 5, free ovate concave spreading sepals, pubescent externally. *Petals* 5, much larger than the sepals, elliptic-ovate, sub-acute, puberulous. *Stamens* 10, the filaments united into a tube in their lower third, pubescent, the alternate shorter, all inserted outside the thick glabrous annular disc. *Anthers* attached to the apices of the filaments, broadly ovate, short, sparsely pubescent. *Ovary* pubescent, conical, surrounded by the disc. *Style* short, ob-conical; *stigma* conical, surrounded at the base by a projecting fleshy annulus. *Fruit* ovoid-globose, with a slightly curved conical apiculus, densely but minutely rusty-puberulous, ·75 in. long.

Andaman Islands; Kurz, King's Collector.

This species is allied to *W. neurodes*, Hiern, from which it differs in its more hairy petals and stamens, thicker style, more conical stigma and apiculate fruit. I dedicate the species to M. Casimir De Candolle, who first detected it as new from fragmentary specimens sent to him by the late Mr. Kurz. M. De Candolle did not include it in his Monograph of *Meliaceæ* (Monogr. Phaner. Vol. I), but kindly communicated the fact of his discovery to me. Specimens since sent to me by the collectors of the Calcutta garden confirm the accuracy of his decision.

4. Walsura hypoleuca, Kurz Rep. Veg. Andam. ed. 2, p. 33. A tree 40 to 50 feet high; young branches stout, puberulous, lenticellate. *Leaves* 12 to 14 in. long, glabrous; leaflets 5, thinly coriaceous, elliptic-oblong, sub-acute, the base cuneate; upper surface shining, the lower glaucous; main nerves 7 or 8 pairs, ascending, prominent beneath;

length 5 to 7 in., breadth 2 to 3 in., the terminal one a third larger and with more nerves; petiolules ·75 in., that of the terminal leaflet 2 in. *Panicles* several from an axil, 4 to 6 in. long, pubescent, the branchlets short and slender with the flowers crowded near their apices. *Flowers* ·15 in. long, on short puberulous pedicels. *Calyx-teeth* 5 or 6, elongate, ovate or lanceolate, puberulous. *Petals* 5, longer than the calyx, elliptic-obtuse, erect, puberulous. *Stamens* 10, distinct, inserted outside the disc, shorter than the petals; the filaments flattened, but not quite so broad as the ovate anthers, sparsely villous. *Disc* annular, cushion-like, entire, glabrous, surrounding the ovoid-conic, villous, ovary. *Style* cylindric, thickened upwards, glabrous; *stigma* discoid. Unripe *fruit* (*fide* Kurz) "oblong, acuminate, greyish-velvetty." Kurz in Journ. As. Soc. Bengal, Vol. 41, Pt. 2, p. 296; For. Flora Burma I, 224; Hiern in Hook. fil. Fl. Br. Ind. I, 564. C. D. Cand. Monogr. Phaner. I, 639.

Andaman Islands: at Port Mowat.

This has been collected only by Kurz and I have never seen its fruit. I believe Kurz's species *C. oxycarpa* is merely a small-leaved form of this. Kurz distinguishes it from this by its thinner leaves and fainter venation,—characters of little value, I fear.

5. Walsura robusta, Roxb. Hort. Beng. 32: Fl. Ind. II, 386. A tree 40 to 60 feet high; young branches slender, lenticellate, glabrous. *Leaves* 7 to 12 in. long. *Leaflets* 3 to 5, sub-coriaceous, ovate-oblong to ovate, entire, bluntly acuminate, the base narrowed; both surfaces glabrous, the upper shining, the lower dull with the 6 or 7 pairs of curving nerves rather prominent; length 3 to 5 in., breadth 1·75 to 2·25 in.; petiolules about ·5 in., that of the terminal leaflet 1·5 in. *Panicles* dense, many-flowered, shorter than the leaves, cinereous-puberulous; bracts (if any) deciduous. *Flower-buds* hemispheric, tomentose, subsessile. *Petals* ·2 in. long (larger than the sepals). *Stamens* 10; the filaments flattened, lanceolate, puberulous, free from each other, inserted outside the broad, thin, sub-concave, pubescent disk. *Ovary* depressed-globose, crowned by the thick style, 2-celled, with 2 ovules in each cell; *stigma* discoid with a central mammilla. *Fruit* elliptic or globular, ·75 in. in diam., when dry capsular, 2-celled, but one of the cells empty. *Seed* pendulous, testa membranous, albumen 0; the cotyledons fleshy, plano-convex; the radicle short, superior. Hiern in Hook. fil. Fl. Br. Ind. I, 565: Kurz For. Fl. Burm. I, 223; C. De. Cand. Monogr. Phaner. I, 638; Wall. Cat. 1266, 8110, 8111, 8112. *Surwala robusta, Roem. Synops.* i. 108. *Monocyclis robusta, Wall. ex Voigt Hort. Suburb. Calcutta* 135. *Scytalia glabra, Ub. Ham. ex Wall. Cat.* 8048 E, *(not the other letters.)*

Andaman Islands: very common. DISTRIB. Brit. India, in Burma, Silhet, Assam, Sikhim.

10. HEYNEA, Roxb.

Trees or rarely shrubs. *Leaves* 5–11-foliolate; leaflets opposite, entire. *Panicles* terminal and axillary, corymbose, long-peduncled; *Flowers* rather small, hermaphrodite. *Calyx* short, 4–5-fid, the lobes imbricate. *Petals* 4–5, oblong, suberect, sub-imbricate. *Staminal tube* 8- or 10-fid; lobes linear, bidentate at apex, bearing the anthers between the linear teeth. *Disk* annular, fleshy. *Ovary* immersed in the disk, 2-3-celled, narrowing into the short style; *stigma* 2–3-dentate, with a thickened ring at the base; *ovules* 2 in each cell. *Fruit* capsular, 1-celled, 2-valved, 1-seeded, glabrous. *Seed* arillate, exalbuminous; aril thin, white; cotyledons hemispherical.—DISTRIB. 1–3 species, limited to Indo-Malaya.

HEYNEA TRIJUGA, Roxb., Hort. Beng. 33. A small tree 15 to 20 feet high. *Leaves* 6 to 16 in. long; leaflets broadly ovate to ovate-lanceolate, shortly acuminate, the base rounded or cuneate; upper surface glabrous, the lower surface glaucous, glabrous or pubescent; the 6 to 8 pairs of curving spreading nerves slightly prominent; length 2·5 to 5·5 in., breadth ·8 to 2·75 in, petiolule ·15 to ·45 in., the terminal ones longer. *Panicles* glabrous as long or nearly as long as the leaves, on long peduncles, with numerous corymbose branches. *Flowers* ·15 in. long. *Petals* much longer than the calyx, their midribs thick, their edges membranous. *Staminal tube* wide. *Ovary* glabrous. *Fruit* ovoid, beaked; the pericarp somewhat fleshy, smooth, splitting by 2 rarely 3 valves. Roxb. in Bot. Mag. t. 1738; Corom. Plants III, 260; Flor. Ind. II, 390; Grah. Cat Bomb. Pl. 31; Adr. Juss. in Mem. Mus. xix. t. 18, f. 17; Dalz. & Gibs. Bomb. Fl. 38; Wall. Cat. 1258; Brandis For. Fl. 70. DC. Prod. I, 624; Monogr. Phaner. I, 713: Hiern in Hook. fil. Fl. Br. Ind. I, 565. *H. affinis*, Adr. Juss. l.c. 275; Beddome Fl. Sylvat. t. 134; W. & A. Prodr. i. 121. *Walsura* (*Heynea*) *pubescens*, Kurz in Journ. Asiat. Soc. Beng. xli. ii. 297. *Walsura trijuga* Kurz For. Fl. Burm. I, 225. *H. connaroides*, Wight ex Voigt Hort. Suburb. Calcutta 136.

Perak: common, and probably also in the other provinces.—DISTRIB. British India, Sumatra.

Var. *multijuga*. DC. Monogr. Phaner. I, 714. Leaflets 11, lanceolate. *H. quinquejuga*, Roxb. Hort. Calc. 90; Fl. Ind. II, 391. Wall. Cat. 1259. *H. Sumatrana*, Miq. Ann. Mus. Lugd. Bat. IV, 60; DC. Monogr. Phaner. I, 714.

Penang: Wallich, No. 1259. Curtis, No. 676.

11. Carapa, Aubl.

Glabrous littoral trees. *Leaves* 2- or 4- or sometimes 6-foliolate; leaflets opposite, quite entire, the nerves faint. *Panicles* lax, axillary, cymose, flowers hermaphrodite. *Calyx* 4-fid, short. *Petals* 4, reflexed. *Staminal tube* urceolate-globose, 8-dentate, the teeth bi-partite: *anthers* 8, 2-celled, included, alternating with the teeth. *Disk* fleshy, cup-shaped, adherent to the base of the ovary. *Ovary* 4-celled, 4-sulcate, the *cells* 2–8-ovuled; *style* short, *stigma* discoid. *Fruit* capsular, sub-globose, large, 4-celled, 6–12-seeded; pericarp fleshy, dehiscing by 4 valves. *Seeds* large, thick, angular; testa hard, spongy, aril 0, hilum large, ventral; cotyledons amygdaloid.—Distrib. About 6 species, all tropical and usually littoral.

Leaves with broad blunt apex and narrow base, coriaceous; panicles stout; fruit as large as an orange ... ... 1. *C. obovata.*

Leaves with sub-acute apex and broad base, very thinly coriaceous; panicles slender: fruit 7 to 10 in. in diam. ... ... 2. *C. moluccensis.*

1. Carapa obovata, Blume Bijdr. 179. *Leaves* 3 to 6 in. long; leaflets 1 to 2 pairs, coriaceous, obovate to oblong, the apex broad, obtuse, rarely notched or sub-acute, the base narrowed; main nerves 6 to 9 pairs, length 3 to 4 in., breadth 1·35 to 1·75 in., petiolules ·2 to ·35 in. *Panicles* 1·5 to 2·5 in. long, stout, cymose, few-flowered. *Flowers* ·25 in. long, their pedicels ·3 to ·5 in. long, bracteolate. *Calyx-teeth* broad, rounded. *Petals* much longer than the calyx, broadly elliptic, the edges imbricate. *Ovary* broadly ovoid. *Fruit* the size of an orange, apiculate when young, but not when ripe. C. DC. Monogr. Phaner. I, 718: Seemann Flora Vitiensis p. 88. *C. moluccensis*, Kurz (not of Lamk. For. Flor. Br. Burma, I, 226: *C. moluccensis*, (in part,) Hiern in Hook. fil. Fl. Br. Ind. I. 567. *Xylocarpus obovatus*, A Juss. Mem. Mel. p. 92; Miq. Fl. Ind. Bat. I, Pt. 2, p. 546.

Malacca: Maingay, (Kew Distrib.) No. 347; Griffith, No. 1098. Perak; Scortechini, King's Collector. South Andaman; Kurz, King's Collectors. Little Andaman: Prain. Distrib. Sunderbuns of Bengal: (Heinig) and others; Java and other islands of the Malayan Archipelago. Tropical Africa.

2. Carapa moluccensis, Lamk. Encyc. Meth I, 621. *Leaves* 4 to 10 in. long; leaflets usually 2 pairs, thinly coriaceous, almost membranous, broadly ovate to ovate- oblong, sub-acute, the base broad, unequal; main nerves about 6 pairs, spreading; length 2 to 4 in., breadth 1·5 to 2·35 in., petiolules ·15 to ·25 in. *Panicles* 3 to 5 in. long, slender, with lax spreading few-flowered branches. *Flowers* as in the last, but

with rather broader petals and a shorter style. *Fruit* sub-globular, 7 to 10 in. in diam. Blume Bijdragen, 179; C. DC. Monogr. Phaner, I, 719: Don. Gen. Syst. I, 686; DC. Prod. I, 626: Bedd. Flor. Sylvat. t. 136: Seeman Flor. Viti, 38; Hiern in Hook. fil. Fl. Br. Ind., (*in part,*) I. 567. *C. indica*, A. Juss. Dict. Sc. Nat. VII., p. 31. *Xylocarpus granatum*, Willd. Spec. III, 328; A. Juss. Mem. Mel. p. 92, t. 20, No. 22; Roxb. Fl. Ind. II, 240: Wight and Arn. Prod. 121; Blanco Flor. Philipp. ed. 2, p. 207; A. Gray U. S. Exped. I, 243. *X. granatum*, Koenig, Miq. Fl. Ind. Bat. I, Pt. 2, p. 546: *X. Forstenii* Miq. Ann. Mus. Lugd. Bat. IV, 62.

South Andaman Island; Kurz, King's Collectors. Great Coco Island; Prain. Distrib. Burma, Malayan Archipelago, S. India, Fiji Islands, Africa.

12. Chickrassia, Adr. Juss.

A tree with pari-pinnate leaves, alternate sub-opposite or opposite oblique entire leaflets, terminal panicles and 4–5-merous flowers. *Calyx* short, dentate. *Petals* oblong, free, imbricate, erect. *Staminal tube* cylindric; its mouth with 10 short blunt teeth. *Anthers* 10, short, attached to the edge of the mouth and entirely exserted. *Disk* none. *Ovary* cylindric, on a short stalk, 3-celled; the ovules numerous, in 2 rows in each cell; *style* very short, stout; *stigma* capitate. *Capsule* woody, 3-celled, loculicidal; the pericarp separating into two layers. *Seeds* numerous, flat, winged below, exalbuminous. A single species.

Chickrassia tabularis, A. Juss. in Mém. Mus. XIX, 251, t. 22, f. 27. A tall tree; young branches stout, lenticellate, sub-glabrous. *Leaves* 12 to 18 in. long; leaflets 10 to 16, ovate to oblong, unequal-sided, acute or acuminate; the base rounded on one side, narrowed on the other: upper surface glabrous, the lower glabrous or more or less velvetty; length 2 to 5 in., breadth 1 to 2·5 in., petiolules ·15 to ·35 in. *Panicles* terminal, erect, shorter than the leaves; the branches spreading, pubescent, many-flowered. *Flowers* ·4 to ·5 in. long. *Calyx* with 5 short, shallow, broad teeth, pubescent outside. *Petals* puberulous outside, pubescent inside. *Capsule* ovoid, 1·75 in. long; seeds ·65 in. long. W. and A. Prod. 123; Thwaites Enum. 61; Wight Ill. t. 56; Bedd. Fl. Sylvat. t. 9; Grah. Cat. Bomb. Pl. 32; Kurz For. Flora Burm. I, 227; Hiern in Hook. fil. Fl. Br. Ind. I, 568; C. DC. Monogr. Phaner. I, 726. *Swietenia Chickrassia*, Roxb. Hort. Beng. 33; Fl. Ind. II, 399. *Plageotaxis Chickrassia*, Wall. Cat. 1269. *S. Sotrophola*, Ham. ex Wall. Cat. p. 214. *Chickrassia triloculuris* Roem. Syn. I, 135; Roxb. ex Buch. Journ. I, 184; G. Don. Gen. Syst. I, 688. *Cedrelae* sp. Wall. Cat. 4892.

Var. *velutina*, leaflets, more or less velvetty beneath. *C. velutina*

Roemer Synops. fasc. I, p. 135; Kurz For. Flora Burma I, 227; C. DC. Monogr. Phaner. I, 717. *C. Nimmonii* Grah. in Wight Ill. 148; Dalz. and Gibs. Fl. Bombay, 38. *Plageotaxis velutina*, Wall. Cat. 1270. *Cedrela velutina*. DC. Prod. I, 625. ? *Cedrela villosa*, Roxb. Hort. Beng. 18. ? *Melia tomentosa*, Kurz Rep. Veg. Andam. ed. i. p. iv., (*not of Roxburgh*). ? *Toona velutina*, *Roem.* Synops. Monogr., i. 139. ? T. *villosa*, *Roem*, l. c. 140.

Malacca: Maingay. Andaman Islands: King's Collectors. Distrib. Burma, British India, Ceylon.

13. Cedrela, Linn.

Tall trees with coloured wood. *Leaves* pinnate; leaflets numerous, opposite or sub-opposite, entire or serrate. *Panicles* terminal and sub-terminal. *Flowers* white, pentamerous. *Calyx* short, 5-cleft. *Petals* sub-erect, oval, imbricated, free. *Stamens* 5, free, inserted at the top of the disk, rarely alternating with staminodes, filaments subulate. *Anthers* oblong, versatile. *Disk* thick or raised, 5-lobed. *Ovary* sessile on the top of the disk, 5-celled; *cells* alternate with the calyx-lobes, each with 8–12 bi-seriate pendulous ovules; *style* filiform; *stigma* discoid. *Capsule* coriaceous, 5-celled, septifragally 5-valved, *valves* consisting of two plates. *Seeds* compressed, winged at the apex or at both ends, with fleshy albumen; *cotyledons* flat, sub-foliaceous.—Distrib. About 16 species, inhabiting Tropical Asia, Australia, and America.

Cedrela febrifuga, Forsten Diss. Cedrel. 16. A tree 80 to 150 feet high; young branches puberulous, lenticellate. *Leaves* 15 to 24 in. long, glabrous; leaflets membranous, 7 to 10 pairs, obliquely ovate-oblong, shortly and bluntly acuminate, the base broad and unequal-sided, the edges entire; main nerves 12 to 15 pairs, sub-horizontal, distinct beneath when dry; length 3·5 to 4·25 in., breadth 1·75 to 2 in., petiolule ·2 in. *Panicles* terminal, shorter than, or as long as the leaves, spreading, glabrous; their ultimate branches short, cymose, crowded. *Flowers* ·2 in. in diam., on short pedicels. Segments of the calyx spreading, much shorter than the petals, obtuse, pubescent at the edges. *Petals* broad, obtuse, pubescent. *Stamens* 6, slightly shorter than the petals, the filaments and ovary sericeous. *Capsule* 1 in. long, lenticellate. *Seeds* winged at each end, ·6 to ·7 in. long. Blume Bijdr. I, 180; A. Juss. Mem. Mel. 103; Miq. Flor. Ind. Bat. V. I, pt. 2, 548; Suppl. 197; Ann. Mus. Lugd. Bat. IV, 63; De Cand. Monogr. Phaner. I, 744. *C. Toona*, Hiern (not of Roxb.) Hook. Fl. Br. Ind. I, 569. *Toona febrifuga*, Roem. Syn. fasc. I, 139.

Penang: Curtis, No. 826. Perak: King's Collector, No. 10403.

In the Flora of British India, Mr. Hiern has reduced this to

C. Toona, Roxb. And there is no doubt that the flowers of the two are very similar, differing chiefly in the hairiness of the petals and stamens of *C. febrifuga*. The panicles, however, of *C. febrifuga* are longer and their ultimate branches are shorter and denser than those of *C. Toona*. The capsules, moreover, are much longer (1 in. as against ·6 in.). The flowers of all the species of *Cedrela* are very much alike. I hesitate therefore, to follow Mr. Hiern merely because very good distinctive characters cannot be had from the flowers, and I prefer to follow De Candolle in maintaining this as a species. The nearest ally of *C. febrifuga* is undoubtedly *C. microcarpa* C. DC.

Order XXVIII. Chailletiaceæ.

Trees or shrubs. *Leaves* alternate, quite entire; *stipules* 2, deciduous. *Flowers* small, unisexual or polygamous, in corymbose cymes; *peduncles* sometimes adnate to the petiole. *Sepals* 5, free or connate, sometimes unequal, imbricate. *Petals* 5, free, sub-perigynous, equal or unequal, notched or 2-fid, with often an inflexed lamina which is adnate to the face of the petal, usually open in æstivation. *Stamens* 5, sub-perigynous, all or some only fertile, free or adnate to the corolla; *Anthers* oblong, connective often thickened at the back. *Disk* of 5 glands or scales, or a 5-glandular or -lobed cup. *Ovary* free, pubescent or villous, 2–3-celled; *styles* 1–2–3, free or more or less connate; *stigmas* simple or capitate; *ovules* anatropous, pendulous in pairs from the top of each cell. *Drupe* pubescent or hispid, oblong, transversely oblong or didymous, compressed; *epicarp* entire or dehiscent; *endocarp* indehiscent or not, 1–3-celled; *cells* 1-seeded. *Seed* pendulous, hilum broad, testa membranous, albumen 0; *embryo* large; *cotyledons* thick, radicle small, superior.—A small chiefly tropical order, of 3 genera and about 40 species.

1. Chailletia, DC.

Flowers polygamo-monœcious. *Sepals* 5, unequal, united at the base or above it, obtuse. *Petals* 5, 2-lobed, narrow, free. *Stamens* 5, sometimes slightly adnate at the base to the petals. *Disk* of 5 quadrate scales placed opposite the petals. *Ovary* 2–3-celled.—Distrib. Tropical Asia, Africa, and especially America; species about 30.

Leaves oblong or elliptic, lanceolate.

Leaves very thin, quite glabrous; cymes globular, ·25 in. to ·4 in. in diam. ... 1. *C. tenuifolia.*

Leaves coriaceous, glabrous except the midrib, strigose at the base; cymes 1 to 2 in. in diam. ... ... 2. *C. Hookeri.*

Leaves membranous, with many fulvous bristles on the edges midribs and nerves	3.	*C. Griffithii.*
Leaves elliptic or oblong-elliptic		
Midribs of leaves strigose beneath; cymes ·5 in. in diam.; ripe drupes ·65 in. broad	4.	*C. Helferiana.*
Midribs of leaves quite glabrous; cymes ·3 in. in diam.; ripe drupes 1·25 in. in diam.	5.	*C. Laurocerasus.*
Leaves elliptic but more or less ob-lanceolate or obovate, glabrous	6.	*C. andamanica.*
Leaves elliptic-obovate, retuse, minutely tomentose on the lower surface	7.	*C. deflexifolia* var. *tomentosa.*

1. Chailletia tenuifolia, King, n. sp. A shrub, 6 feet high; young branches, angular, puberulous. *Leaves* thinly membranous, elliptic-lanceolate, tapering to either end, the apex shortly acuminate: both surfaces glabrous and reticulate; main nerves 5 to 8 pairs, ascending, curving and interarching boldly, depressed on the upper, prominent on the lower surface; length 6 to 8 in., breadth 2·25 to 2·75 in.; petiole ·15 in., strigose. *Cymes* small, globular, ·25 to ·4 in. in diam., axillary, solitary; their pedicels ·15 in., strigose. *Flowers* sub-globular, ·05 in. in diam. *Sepals* erect, elliptic, obtuse, minutely sericeous outside, glabrous inside. *Petals* shorter but broader than the sepals, glabrous, slightly bifid at the apex, the lobes sub-acute. *Stamens* shorter than the petals, the filaments slightly sericeous, shorter than the oblong innate anthers, connective slightly sericeous. *Ovary* ovoid, densely sericeous-lanate; *style* short. *Ripe fruit* deeply 3-lobed ·6 in. long and ·75 in. broad.

Perak: King's Collector, No. 3498.

This species shows no tendency to become scandent.

2. Chailletia Hookeri, King, n. sp. A climber; young branches terete, puberulous at first, afterwards glabrous. *Leaves* coriaceous, oblong-lanceolate and acuminate (rarely oblong and obtuse or sub-acute), the base narrowed, reticulate and shining on both surfaces, glabrous except a few strigose hairs on the midrib near the base; main nerves 8 to 10 pairs, curving and interarching far from the edge; length 4·5 to 6·5 in., breadth 1·5 to 2 in.; petiole ·25 in., strigose. *Cymes* axillary, usually in pairs, pedunculate, tomentose, dichotomous, spreading, 1 to 2 in. in diam., the peduncles ·5 to ·75 in. long. *Flowers* about ·1 in. long. *Sepals* oblong, blunt, erect, concave, sericeous-tomentose outside, glabrous inside. *Petals* glabrous, shorter but broader than the sepals, deeply divided into two concave irregularly obovate overlapping

segments. *Stamens* about as long as the petals, glabrous; *anthers* adnate, blunt, broad, the cells on the edges of the connective. *Ovary* ovoid, densely lanate-sericeous; *style* elongate, thin. *Ripe drupe* unknown. Wall. Cat. No. 7443.

Penang: Porter. Perak: Scortechini.

This is the species referred to by Sir Joseph Hooker (Fl. Br. Ind. I, 572), as probably an undescribed species of *Chailletia*. The species, when Sir Joseph wrote, was known only by Porter's incomplete specimens. A few specimens of what is evidently the same plant were collected by the late Father Scortechini in Perak, and these have enabled me to describe the flowers. The fruit, however, still remains unknown.

3. Chailletia Griffithii, Hook. fil. Fl. Br. Ind. I, 571. A slender climber; young branches striate, dark-coloured when dry, clothed with numerous long, spreading, stiff, fulvous hairs with minute soft, short, white pubescence between. *Leaves* membranous, oblong-lanceolate, acuminate, the base rounded or minutely cordate; upper surface glabrous except the sparsely bristly midrib, the lower with numerous bristles on the midrib and a few scattered elsewhere chiefly on the nerves, the edges ciliate; main nerves 9 to 11 pairs, ascending, rather bold beneath; length 4 to 7 in., breadth 1 to 2 in., petiole ·1 in., densely bristly. *Cymes* globular, axillary, sessile, densely bristly, ·4 to ·5 in. in diam. *Flowers* campanulate, nearly ·25 in. across at the mouth. *Sepals* sub-erect, narrowly ovate, densely sericeous on the outer, and slightly pubescent on the inner surface. *Petals* glabrous, not longer than the sepals but broader, obovate, the apex shortly bifid, the lobes sub-acute, concave. *Stamens* as long as the petals, the anthers short, broadly ovate, the cells anterior. *Ovary* ovate, densely lanate-sericeous; *style* shorter than the stamens; *stigmas* 3, small, truncate. *Ripe fruit* (*fide* Hooker) 1·5 in. long, 2-celled. *C. lanuginosa*, Maing. MSS.

Perak; King's Collector, No. 6117. Malacca; Griffith, No. 2169 (Kew Distrib.), Maingay, No. 370.

Griffith describes this as "a shrub." It is actually a climbing shrub 15 to 20 feet long. The flowers are white.

4. Chailletia Helferiana, Kurz in Journ. As. Soc. Bengal, XLI, (1872), Pt. 2, 297. Scandent; young branches adpressed-yellowish pubescent, terete. *Leaves* thinly coriaceous, elliptic or oblong-elliptic, shortly and abruptly acuminate, the base cuneate, both surfaces reticulate (the lower rather obscurely so) and glabrous, the midrib strigose beneath; main nerves 7 or 8 pairs, spreading, faint; length 4 to 6 in., breadth 1·25 to 2·25 in.; petiole ·25 in., strigose. *Cymes* solitary, axillary, about ·5 in. in diam.; their pedicels about ·3 in. long, strigose.

Flowers sub-globular, less than ·1 in. long. *Sepals* broadly ovate, blunt, sericeous on the outer, pubescent on the inner surface. *Petals* smaller than the sepals, elliptic, obtuse, shortly bifid, the lobes blunt. *Filaments* very short, the anthers ovate, the cells anterior. *Ovary* conical, laxly sericeous. *Ripe drupe* transversely oblong, compressed, ·65 in. broad, and only ·4 in. long, minutely tomentose. Hook. fil. Fl. Br. Ind. I, 570.

Langkani; Curtis, No. 1687.—Distrib. Burma, Wall. Cat. 4038. Tenasserim; Helfer (Kew Distrib.), No. 2172.

Curtis's Langkani specimens are in fruit only, and those of Helfer's Tenasserim collecting (the type of the species) are in flower only. But the two seem identical. I have not seen the Wallichian sheet No. 4038.

5. Chailletia Laurocerasus, Planch. ex Hook. fil. Fl. Br. Ind. I, 572. A scandent glabrous shrub 30 to 40 feet long; young branches slender, dark-coloured. *Leaves* coriaceous, elliptic or elliptic-oblong, obtusely acuminate, the base narrowed, upper surface shining when dry, the lower paler; main nerves 7 or 8 pairs, spreading, faint; length 3·5 to 4·5 in., breadth 1·5 to 2·5 in., petiole about ·1 in. *Cymes* axillary, globose, few-flowered, ·3 in. in diam., shortly pedunculate. *Flowers* ·15 to ·2 in. in diam. *Sepals* hoary outside, glabrous inside, broadly ovate or orbicular, concave. *Petals* longer than the sepals, glabrous, oblong, cut half way down into two oblong blunt concave slightly divergent segments. *Filaments* nearly as long as the petals; *anthers* shortly ovate. *Ovary* densely lanate-sericeous, broadly ovoid; *style* stout, *stigma* concave. *Drupes* transversely oblong or globose, 1·25 in. in diam. when ripe, the epicarp hoary; *endocarp* thick, tuberuled outside, 1- or 2-seeded. Wall. Cat. 7513, (*indeterminatæ*).

Penang; common. Perak: King's Collector.

6. Chailletia andamanica, King n. sp. A small tree; young branches pale-brown, lenticellate, puberulous. *Leaves* thinly coriaceous, elliptic-oblanceolate or elliptic-obovate, abruptly and shortly blunt-acuminate, much narrowed at the base; both surfaces glabrous, minutely reticulate, pale when dry; main nerves 4 to 6 pairs, much curved and interarching far from the edge, only slightly prominent on either surface; length 3 to 4·75 in., breadth 1·25 to 2·5 in., petiole ·15 to ·2 in. *Stipules* lanceolate, about as long as the petiole. *Flowers* in dense axillary shortly pedunculate dichotomous cymes. *Buds* ovoid-globular. *Sepals* 5, sub-rotund, very concave, hoary externally, much imbricate. *Petals* 5, quadrate, not bifid, glabrous, shorter than the sepals. *Stamens* shorter than the petals, the filaments very short, anthers ovate. *Rudimentary ovary* ovoid, compressed, hairy. *Female flowers* not seen. *Fruit* about ·5 in. broad, and ·4 in. depth, transversely oblong, much compressed, puberulous, divided into two lobes by a deep vertical groove,

2-celled, 2-seeded, (often from the abortion of one of the cells) ovoid, 1-celled and 1-seeded.

South Andaman Island; King's Collectors.

The greatest breadth of the leaves in this species is above the middle, and in this respect it differs from *C. gelonoides*. The point of the leaves is also shorter than in that species; the flowers are less hairy, the cymes less crowded, and they are pedunculate and not sessile as in *C. gelonoides*.

7. Chailletia deflexifolia, Turcz. in Bull. Mosc. 1863, pt. 1, 611, var. *tomentosa*. A climber, 10 to 30 feet long; young branches densely and minutely olivaceous-tomentose. *Leaves* thinly coriaceous, elliptic-obovate, retuse; upper surface minutely reticulate when dry, glabrous when adult except the minutely tomentose midrib and nerves; lower surface softly and minutely pilose, the midrib tomentose as are the 5 to 7 pairs of curved, spreading, main nerves; length 4·5 to 6·5 in., breadth 2·5 to 3·25 in., petiole ·3 to ·4 in. *Cymes* axillary, and often terminal, pedunculate, tomentose, dichotomous, spreading, often 3 in. in diam.; the peduncles 1 to 1·25 in. long, stout. *Flowers* ·25 in. in diam. *Sepals* oblong-lanceolate, deflexed, sericeous-tomentose outside, glabrous inside. *Petals* as long as the sepals, deeply divided into 2 lanceolate segments. *Stamens* as long as the petals, the anthers shortly ovate. *Ovary* densely lanate-sericeous, depressed globular, the style slender, stigma small. *Drupes* compressed, rotund-reniform, sericeous, rugose, pitted, 1 in. broad; the endocarp very hard, 2-celled, 2-seeded. Hook. fil. Fl. Br. Ind. I, 571; Wall. Cat. 9016 (*indeterminatæ*).

Malacca; Griffith, Maingay. Perak; King's Collector, Wray, Scortechini.

Order XXIX. Olacineæ.

Trees or shrubs, rarely herbs, sometimes climbing. *Leaves* alternate, rarely opposite, simple or lobed, penni- or palmi-nerved, exstipulate. *Inflorescence* cymose or racemose, rarely capitate, terminal, axillary or extra-axillary, sessile or more or less peduncled. *Flowers* regular, hermaphrodite, polygamo-dicœcious or dicœcious. *Calyx* usually small, 4–5-toothed, sometimes accrescent, free or adherent to the fruit, lobes valvate or imbricate. *Petals* 3–6, valvate or imbricate, free, or more or less coherent. *Stamens* 3–15, inserted with the petals, free or adnate to them and either opposite to or alternate with them, all fertile, or some (staminodes) anantherous, disunited or more or less monadelphous. *Anthers* erect, 2-celled, dehiscing longitudinally. *Disc* hypogynous or perigynous, cup-shaped, often absent. *Ovary* free, or half inferior, 1-celled or imperfectly 2–3–5-celled (from the dissepiments not

reaching the apex of the cavity). *Style* simple or 0, rarely divided; *stigma* 1 rarely 2, entire or lobed; *ovules* 1–5, pendulous from the apex of a minute free central placenta, or from the side or apex of the ovarian cavity; *funicle* (or placenta?) often dilated into a thickened process above the ovule. *Fruit* drupaceous or dry, indehiscent, 1- rarely 2-celled, 1- rarely 2-seeded, free, or more or less adnate to the calyx-tube and disk. *Seed* pendulous; albumen fleshy, entire or lobed, rarely 0; *radicle* superior; *cotyledons* leafy, flat or folded, rarely fleshy.—Distrib. Genera about 45, species about 220, widely distributed through the Tropics of both hemispheres.

The *Olacineæ* are rather an assemblage of plants than a Natural Order. The solitary character which is common to all the species included under the title is pendulous ovulation; and even that character is obscured by the fact that, in a number of the genera, the ovules are pendulous from the apex of a minute free central-placenta which does not grow as the pistil developes, so that the seeds are erect in the fruit and have the appearance of originating from a basal placenta. In the remaining genera, both ovules and seeds are unmistakably pendulous from the apex, or from near the apex, of the cavities of the ovary and fruit. The majority of the genera have hypogynous stamens and superior fruit. But in *Erythropalum* the stamens are perigynous and the fruit is inferior; while *Cansjera* and *Lepionurus* have their stamens perigynous in the flower, but the fruit (from the development of the fertilized pistil in a downward direction) is most distinctly inferior. In by far the greater majority of the species the stamens are free from each other, or, at the most, are slightly coherent by their bases: but in *Harmandia* the sessile anthers are attached near the mouth of a fleshy staminal tube like that found in *Meliaceæ*; and this tube, in an anantherous condition, is found in the pistillate flowers. By far the greater number of the genera have both calyx and corolla; but in *Cansjera* and *Lepionurus* the perianth is single, and in *Phytocrene* and *Miquelia* the organs which take the place of the outer whorl of the flower appear to be rather bracts than a true calyx. In most of the genera the petals are really free from each other; for, although many of them cohere by their edges for a time, they ultimately become separate; while in a smaller number there is genuine cohesion near their bases. In *Harmandia* however the corolla is gamopetalous and urceolate at all times and its texture is fleshy.

All the genera treated of below are woody except *Cardiopteris* which is herbaceous, and which moreover has milky juice. And all the genera have alternate leaves except *Ctenolophon* in which the leaves are opposite. The whole order appears to me to be in want of revision: and the study of the species described below leads me to incline to the opinion that several of the sub-tribes would be better treated as distinct natural orders; while one (*Opilieæ*) might be transferred to *Santalaceæ*.

Fruit drupaceous: Stigma 1.

Ovules pendulous from the apex of a minute axile placenta; seed spuriously erect.

Dichlamydeous, ☿: fruit superior.

Sub-Tribe I.—*Olaceæ*. Stamens aniso-

merous, twice as many as or equal to and opposite the petals: ovary 2- to 5-celled at the base, 1-celled at the apex, or simply 1-celled.

Fruit superior.

Calyx much enlarged in the fruit.

Fertile stamens 3 to 5, not in a tube ... ... 1. *Olax.*

Stamens 4, the filaments forming a fleshy tube ... 2. *Harmandia.*

Calyx not enlarged in the fruit.

Fertile stamens 12 to 15 ... 3. *Ochanostachys.*

Fertile stamens 5 ... 4. *Bracea.*

Fruit inferior ... ... 5. *Strombosia.*

Monochlamydeous, ♂ ; fruit inferior.

Sub-Tribe II.—*Opilieæ.* Stamens equal in number to the segments of the perianth and opposite to them ; ovary 1-celled, 1-ovuled.

Scandent ... ... 6. *Cansjera.*

Shrubby ... ... 7. *Lepionurus.*

Ovules and seeds pendulous from the apex of the ovary and fruit.

* Stamens hypogynous.

Sub-Tribe III.—*Ximeniae.* Stamens as many as or twice as many as the petals; ovary 2- to 4-celled at the base, 1-celled at the apex.

Leaves opposite ... ... 8. *Ctenolophon.*

Leaves alternate.

Fertile stamens 10.

Stamens hypogynous, free from the petals ... ... 9. *Ximenia.*

Stamens attached by pairs to the petals ... ... 10. *Scorodocarpus.*

Fertile stamens 6, concealed in the concavities of the petals ... 11. *Anacolosa.*

Sub-Tribe IV.—*Icacineæ.* Flowers dichlamydeous, ♂, or polygamo-dicœcious : stamens equal in number to the petals and alternate with them; ovary 1- rarely 2-celled, ovules 2 (rarely 1). Shrubs or trees.

Ovary and fruit 1-celled.
Flowers polygamo-dioeceous; ovary in female flowers cylindric, with large sessile discoid stigma.
Sepals 5, distinct, imbricate; male flowers in short axillary interrupted glomerulose spikes ... ... 12. *Platea.*
Calyx cupular, 4 5-toothed, flowers in cymes ... 13. *Gomphandra.*
Flowers hermaphrodite, stigma minute ... ... 14. *Lasianthera.*
Ovary and fruit 2-celled, the cells 1-ovulate (1 cell aborting) ... 15. *Gonocaryum.*

Sub-Tribe V.—*Phytocreneæ.* Flowers monoecious or dioeceous, mono-ordichlamydeous, 4- or 5-merous (the pieces imbricate): stamens equal in number to and alternate with the segments of the perianth in the monochlamydeous, and with those of the corolla in the dichlamydeous species: ovary 1-celled, ovules 2. Scandent shrubs.
Flowers monochlamydeous.
Flowers 4-merous, those of both sexes in capitules, bracteoles close to the flower; drupe bristly ... ... 16. *Phytocrene.*
Flowers 5-merous, the males umbellate, the females capitate, bracteoles separated from the flower by a long stalk; drupe not bristly ... 17. *Miquelia.*
Flowers dichlamydeous.
Flowers sessile in long pendulous interrupted spikes; filaments longer than the anthers: drupe pulpy ... ... 18. *Sarcostigma.*
Flowers in cymose panicles; filaments shorter than the anthers; drupe with very little, if any, pulp ... 19. *Iodes.*

** Stamens perigynous.

Sub-Tribe VI.—*Erythropaleæ.* Flowers dichlamydeous, ♂. Petals 5, perigynous, the stamens as many as and inserted opposite to them. Ovary half-immersed in the perigynous disk, 1-celled, with 1 to 3 ovules. Fruit inferior, crowned by the persistent calyx-lobes and by the disc, pericarp splitting vertically into 3 to 5 pieces. Scandent tendril-bearing shrubs ... 20. *Erythropalum.*

Fruit samaroid; Stigmas 2.

Sub-Tribe VII.—*Cardiopteridæ.* Flowers dichlamydeous, ♂ : corolla gamopetalous, the stamens equal to and alternate with its segments; ovules pendulous; stigmas 2, one at least of them persistent at the apex of the samaroid fruit.

Trees; ovary 2-celled, with 1 ovule in each cell, fruit 2-celled ... ... 21. *Pteleocarpa.*

Herbs; ovary 1-celled, ovules 2 (1 usually abortive), fruit 1-celled, juice milky ... 22. *Cardiopteris.*

1. Olax, Linn.

Trees or shrubs, often scandent, sometimes armed. *Leaves* alternate, petioled, simple. *Racemes* axillary, simple, or branched. *Bracts* minute. *Calyx* minute, cup-shaped, truncate or obscurely toothed, accrescent. *Petals* 4 or 5, hypogynous, valvate, free or more or less coherent. *Fertile stamens* usually 3, generally opposite the edges of the petals and attached to their bases, rarely opposite their centres; *anthers* adnate to the filaments, oblong, 2-celled, dehiscing longitudinally. *Staminodes* 5-6, bifid, usually opposite the petals. *Ovary* free, usually surrounded by a shallow, cup-shaped, hypogynous disk, more or less 3-celled below, 1-celled above; *style* simple, terminal, stigma 3-lobed; *ovules* 3, linear, pendulous from the apex of a central placenta. *Fruit* more or less covered by the accrescent fleshy calyx; *stone* crustaceous, 1-celled, 1-seeded. *Seed* inverse, albuminous; *embryo* minute, in the apex of albumen; *radicle* superior.—Distrib. 25–30 species, natives of the tropics of the Old World.

1. Olax imbricata, Roxb. Fl. Ind. I, 164. A scandent unarmed

shrub; young branches terete, puberulous when very young. *Leaves* coriaceous, oblong-lanceolate to ovate-oblong, acute, the base rounded or narrowed; both surfaces glabrous, the upper shining, reticulate, the lower dull and the nervation indistinct; main nerves 8 or 9 pairs, faint, spreading; length 3·5 to 5·5 in., breadth 1·25 to 2·75 in., petiole ·2 to ·35 in. *Racemes* about ·5 in. long, many-flowered; the bracts rather large, ovate, concave, imbricate when young, deciduous. *Flowers* about ·5 in. long; petals 6, united in pairs. *Fertile stamens* 3, about as long as the pale staminodes. *Fruit* sub-globose, the apex truncate, ·5 in. in diam., enveloped except at the apex by the accrescent calyx. Wall. Cat. 6775; A. B. Decaisne Nouv. Ann. Mus. III, 438; Miq. Fl. Ind. Bat. I, Pt, I. 785; Hook. fil. Fl. Br. Ind. I. 577; Kurz For. Flora Burma I, 234; Valeton, Olacineæ, 115.

Andaman and Nicobar Islands, Malacca. Distrib: Java, Phillippines, Burmah, Chittagong.

Although I have not included *O. merguensis*, Planch as a synonym of this, I cannot see how it can be specifically separated. *O. Wightiana*, Wall. also appears to me to resemble this too closely to be kept distinct as a species.

2. Harmandia, Pierre.

Trees with alternate, simple, entire, petiolate leaves. *Flowers* unisexual, racemose, pedicellate, solitary in the axils of bracteoles. *Calyx* cupular, entire or 4-toothed, greatly enlarged and persistent in the fruit. *Corolla* campanulate or urceolate, fleshy, with 4 short acute valvate lobes (in the female flowers 6-to 8-lobes ?) *Disc* short, thin, annular, crenulate, deciduous, embracing the outside of the base of the cylindric staminal tube. *Anthers* 4, sessile, inserted at the mouth of the thick fleshy staminal tube opposite the teeth of the corolla, bilocular, introrse, the apices reflexed, the connective thick. *Pistil* superior, pyramidal, surrounded in the female flower by the barren staminal tube, 1-celled; *stigma* 3-lobed, sessile; *ovules* 2 (usually only 1), short, free, descending from the apex of the short trigonous central placenta. *Drupe* oblong, 1-seeded, surrounded at the base by the large, fleshy, spreading, coloured accrescent calyx; *epicarp* fleshy, *endocarp* ligneous. *Seed* solitary, filling the cavity of the fruit, its testa thin and inseparable from the fleshy albumen; *embryo* minute, excentric, oblique, near the apex of the allumen. *Cotyledons* flat, shorter than the radicle. Distrib. 2 species; both Malayan.

This genus founded by M. Pierre (Bull. Soc. Linn. Paris, No. 97, p. 770), is remarkable in having a fleshy staminal tube very like that of some *Meliaceæ*, and for the enormous development of the accrescent calyx which forms a large coloured collar round the ripe fruit.

1. Harmandia kunstleri, King, n. sp. A glabrous tree 30 to 40 feet high; young branches slender, striate. *Leaves* coriaceous, ovate-lanceolate or lanceolate, shortly and bluntly acuminate, the base cuneate; main nerves about 6 pairs, very indistinct on both surfaces; length 2·5 to 3·5 in., breadth 1 to 2 in., petiole ·25 to ·5 in. *Racemes of female flowers* axillary, solitary, not much longer than the petioles. *Flowers* ·15 in. long, solitary in the axils of oblong obtuse bracteoles. *Calyx* flat, spreading, with 4 very obtuse teeth. *Corolla* four times as long as the calyx, urceolate; teeth 4, acute. *Ovary* hidden (except the stigmas) by the barren staminal tube and by the corolla, pyramidal, the style short; 1-celled with a single spuriously erect ovule: *stigma* solitary, capitate. *Fruit* oblong, obtuse, 1·25 in. long, and ·6 in. in diam., surrounded at the base by the greatly enlarged coloured corrugated calyx which forms a frill 3 to 4 in. in diam.

Perak; King's Collector.

A very striking plant. The accrescent calyx forms an enormous waxy collar round the base of the fruit which, at first green, changes into a beautiful flesh-colour, the central part being bluish-black. This species is closely allied to *Harmandia mekongensis*, Pierre (For. Flora Coch. China, t. 264), from which it differs in having an urceolate (not tubular-campanulate) corolla and a larger fruit with the accrescent calyx less invaginated at the base.

3. Ochanostachys, Mast.

Trees or shrubs. *Leaves* alternate, petiolate, penni-nerved. *Flowers* numerous, on long slender branching axillary spikes. *Calyx* cup-shaped, 4–5-toothed, not accrescent. *Petals* 4–5, free, valvate. *Stamens* 12–15, hypogynous, or adherent to the base of the petals; filaments subulate, glabrous; *anthers* 4-celled, opening longitudinally; *staminodes* 0. *Disk* hypogynous, fleshy, very shallow, annular, inconspicuous; *ovary* free, sub-hemispheric, incompletely 3-celled beneath, 1-celled above; *style* short, cylindric; *stigma* minute, terminal, 3-lobed; *ovules* 1 in each cell, pendulous from the apex of a central placenta. *Fruit* drupaceous, 1-celled, 1-seeded.—Distrib. Species 1 or 2; natives of the Malay Peninsula and Borneo.

1. Ochanostachys amentacea, Mast. in Hook. fil. Fl. Br. Ind. I, 579. A tree 30 to 40 feet high; young branches glabrous, the tips alone puberulous. *Leaves* thinly coriaceous, elliptic-oblong, entire, bluntly sub-acuminate, the base slightly narrowed, both surfaces glabrous; main nerves 5 (rarely 4) pairs, ascending, prominent on the lower, depressed on the upper surface when dry; length 3 to 5 in., breadth 1·5 to 2·5 in., petiole ·5 to ·75 in. *Racemes* as long as or longer

than the leaves, narrow, sometimes branched, axillary, interrupted. *Flowers* on short pedicels with minute ovate, acute bracts at the base; oblong-ovate in bud, less than ·1 in. long. *Petals* ovate, glabrous outside with a few coarse hairs inside. *Ovary* vertically striate. *Fruit* ovoid-pyriform, 1·25 in. long, and ·8 in. in diam.; the pericarp glabrous, thin, the endocarp bony, with one large cell and a single seed. Valeton, Olacineæ, 104. *Petalinia bancana*, Beccari in Malesia, I, 257.

In all the provinces except the Andaman and Nicobar Islands. Common.—Distrib. Borneo.

This is a very common tree in the Malayan Peninsular where its vernacular name is "Petaling." The same name is applied to it in Borneo, and of this name Beccari's *Petalinia* is an adaptation.

4. Bracea, nov. gen. King.

Arboreous; *leaves* alternate, simple, entire, petiolate. *Panicles* few-branched, axillary or terminal, nearly as long as or longer than the leaves. *Flowers* hermaphrodite, small, shortly pedicelled, scattered or sub-glomerulate, minutely bracteolate. *Calyx* of 5, free, imbricate, broad, non-accrescent, campanulate sepals. *Petals* 5, hypogynous, slightly united at the base, much imbricate, glabrous. *Stamens* 5, opposite the petals; filaments shorter than the anthers, very broad. *Anthers* ovate, innate, 2-celled, with introrse longitudinal dehiscence. *Staminodes* none. *Ovary* broadly ovate, pyramidal, tapering to the short style, imperfectly 2-celled at the base, 1-celled towards the apex; *stigma* small, 2-lobed. *Ovules* 2, from a short axile basilar placenta. *Fruit* drupaceous, 1-celled, with a single spuriously erect seed.

A genus near *Ochanostachys*, Oliver; but with only 5 stamens, very different in form from those of that genus. I dedicate this to Mr. L. Brace, formerly Curator of the Calcutta Herbarium.

1. Bracea paniculata, n. sp., King. A glabrous tree 50 to 70 feet high; young branches dark-coloured, smooth. *Leaves* coriaceous, ovate to elliptic, sub-acuminate, the base rounded; upper surface shining, the lower dull; main nerves 7 or 8 pairs, curved, spreading, slightly prominent beneath when dry; length 3·5 to 8·5 in., breadth 1·85 to 2·75 in., petiole ·65 to ·8 in. *Panicles* with few, spreading, spike-like branches. *Flowers* ·1 in. long, on pedicels of about the same length, glabrous, the calyx half as long as the corolla; petals and sepals broadly ovate. *Stamens* shorter than the petals, glabrous; *disk* hypogynous. *Fruit* drupaceous, ellipsoid, blunt, glabrous (unripe), ·75 in. long, and ·4 in. in diam.; the calyx persistent at its base, but not accrescent; *pericarp* fleshy, *endocarp* leathery. *Seed* solitary, attached to the base of the cell.

Perak; Scortechini, No. 288, King's Collector, No. 8086.

5. Strombosia, Blume.

Trees or shrubs. *Leaves* alternate, petioled, simple, penni-nerved. *Inflorescence* shortly cymose. *Flowers* regular, hermaphrodite. *Calyx* a shallow cup, more or less 5-lobed, inferior (partly superior in some species). *Petals* 5, free, hairy within. *Stamens* 5, opposite the petals and adnate to their bases. *Anthers* 2-celled, introrse. *Staminodes* 0. *Ovary* wholly superior, or (in some species) partly inferior, imperfectly 4- 5-celled, surrounded by a perigynous lobed disk. *Style* simple. *Ovules* 4–5, pendulous from a central placenta. *Fruit* drupaceous, surmounted by the remains of the calyx-lobes and of the style, stone crustaceous. *Seed* pendulous, embryo minute within fleshy albumen. Distrib. Species 6, natives of the Western Peninsula, Ceylon and the Malayan Archipelago.

Flowers in pedicelled few-flowered cymes ... 1. *S. javanica.*
Flowers in sessile many-flowered fascicles ...
Leaves ovate to oblong-ovate; petals ·2 in. long ... ... 2. *S. multiflora.*
Leaves more or less rotund; petals ·15 in. long ... ... 3. *S. rotundifolia.*

1. Strombosia javanica, Blume Bijdr. 1154. A tree 20 to 50 feet high; young branches rather slender, glabrous *Leaves* thinly coriaceous, glabrous, oblong to elliptic, shortly acuminate, the base rounded; main nerves 5 or 6 pairs, curved, ascending, slightly prominent beneath; length 4 to 7 in., breadth 1·65 to 2·65 in., petiole ·6 to ·75 in. *Cymes* axillary, not longer than the petioles, few-flowered; bracteoles small, deciduous, leaving pale scars. *Flowers* ellipsoid in bud, about ·2 in. long. *Calyx* nearly flat with 5 short lobes, inferior in the flower; (accrescent and half inferior in the fruit). *Petals* erect, much exceeding the calyx, oblong, obtuse, hairy towards the apex. *Stamens* 5, opposite to, nearly as long as, and adhering to the petals. *Ovary* elongate, tapering into the short style. *Fruit* oblong-ovoid, glabrous, ·8 in. long, and ·6 in. in diam., the apex crowned by the calyx and disc. Blume Mus. Bot. Lugd. Bat. I, 251; Miq. Fl. Ind. Bat. I, Pt. I, 787; Mast. in Hook. Fl. Br. Ind. I, 579; Kurz For. Flora Burmah, I, 235; Valeton, Olacineæ, 86.

Penang: Wallich. Malacca: Maingay. Perak: King's Collectors.

2. Strombosia multiflora, King, n. sp. A glabrous tree 50 feet high and upwards; young branches slender, striate, minutely lenticellate, cinereous when dry. *Leaves* coriaceous, ovate to oblong-ovate, acute or shortly acuminate, slightly oblique, rounded at the base, the edges undulate; leaves 5 to 8 pairs, slightly curved, ascending, slightly prominent on the lower, obsolete on the upper, surface; length 2·5 to 4

in., breadth 1·5 to 2 in., petiole ·35 in. *Flowers* in dense axillary fascicles; pedicels shorter than the flowers, each with several rotund, concave, minute bracteoles, one of which is close to the calyx. *Calyx* a shallow cup with 5 broad rounded concave segments. *Petals* ·2 in. long, much longer than the calyx, erect, oblong, obtuse, their apices re-curved, pubescent on the edges and in the upper fourth of the inner surface. *Stamens* opposite the petals to which their filaments are attached for two-thirds of their length; *anthers* short, ovate. *Ovary* sub-globular, grooved, much shorter than the long cylindric style, *stigma* minute. *Fruit* unknown.

Perak: King's Collector, No. 7824. Penang: Curtis, No. 859.

Evidently a *Strombosia*; the fruit, however, is as yet unknown.

3. Strombosia rotundifolia, King. A tree or shrub; young branches rather stout; their bark cinereous, rugose, much lenticellate. *Leaves* coriaceous, more or less rotund, glabrous; main nerves 6 or 7 pairs, rather straight, sub-ascending, obsolete on the upper, slightly prominent on the lower surface when dry; length 2·5 in., breadth 2 in.; petiole ·3 in., stout. *Fascicles* small, axillary, few-flowered, shorter than the petioles; pedicels short, each with 2 or 3 minute rotund scale-like bracteoles. *Calyx* cupular, with 5 broad rounded imbricate teeth. *Petals* ·15 in. long, much longer than the calyx, oblong, hairy on the upper half inside, otherwise glabrous; *filaments* adnate to the petals for half their length, *anthers* ovate. *Ovary* sub-globular, *style* cylindric. *Fruit* (*fide* Masters) "the size of a pea, glaucous, globose." *Anacalosa Maingayi*, Mast. in Hook. fil. Br. Ind. I, 580.

Singapore: Maingay (Kew Distrib.), No. 1019.

A species closely allied to *S. multiflora*, King, but with differently shaped leaves. The fascicles of this are fewer-flowered, and the flowers are smaller than in that species. I have seen only Maingay's specimen of this, and there is no fruit on it. Dr. Masters puts this plant into *Anacalosa*, but its petals and anthers are those of *Strombosia*, to which genus I venture to remove it.

6. Cansjera, Juss.

Climbing shrubs, sometimes spiny. *Leaves* alternate, entire, penni-nerved. *Flowers* bracteate, in short axillary spikes, monochlamydeous, hermaphrodite. *Perianth* tubular or urceolate, regular, 4- 5-parted, lobes valvate. *Stamens* as many as the lobes of the perianth and opposite to them; filaments glabrous, free, or attached between the fleshy thick lobes of the disk. *Anthers* small, oblong, adnate, 2-celled, dehiscing longitudinally. *Ovary* superior, ovoid-conical, 1-celled. *Style* cylindric; stigma capitate, 4-lobed. *Ovule* solitary, erect, or pendulous

from a short placenta. *Fruit* superior, drupaceous, surrounded at the base by the marcescent perianth; sarcocarp thin, endocarp bony. *Seed* solitary, erect, roundish; embryo in the upper part of the fleshy albumen, radicle superior; cotyledons sometimes 3, very long, plano-convex. Distrib. Species 3–4, natives of Tropical Asia and Australia.

Cansjera Rheedii, Gmel. Syst. I, 280. A climbing shrub; the young branches olivaceous, puberulous, sometimes spiny. *Leaves* thinly coriaceous, oblong-lanceolate to ovate, acute or acuminate, the base slightly narrowed, both surfaces glabrous; main nerves 3 to 5 pairs, curved, ascending, faint; length 2·5 to 4 in., breadth 1 to 1·5 in., petiole ·15 in. *Spikes* 1 or 2 from an axil, ·5 to 1 in. long, tomentose; bracteoles minute, linear-lanceolate, one at the base of each flower. *Flowers* ·1 in. long, pubescent externally, apices of the teeth of the perianth re-curved. *Fruit* ovoid, ·4 in. long, glabrous; *embryo* straight in the axis of copious albumen. Wall. Cat. 1043, B; Wight Ic. t. 1861; Bedd. Flor. Sylvat. Anal. Gen. t. xxvi.; Thwaites Enum. 251; Brandis For. Flor. 75; Hook. fil. Fl. Br. Ind. I, 582; Kurz For. Flora Burma I, 237: Valeton Olacineæ 158. *C. scandens*, *Roxb.* Cor. Pl. 103; Fl. Ind. i. 441. *C. malabarica*, Lamk. Dict. iii. 433. *C. zizyphifolia*, *Griff.* Notul. iv. 360, t. 537, f. 1. *C. martabanica*, Wall. Cat. 7266. Olax? *sumatrana*, Miq. Fl. Ind. Bat. Suppl. i. 342. *Opilia amentacea*, Roxb. Fl. Ind. I, 86 Wall. Cat. No. 2331, *C. Rheede* Hort. Mal. vii. t. 2, 4. Wall. Cat. *Canscora*, No. 7537.

Andaman and Nicobar Islands: Malacca.—Distrib. British India, Malayan Archipelago.

I can find no trace of calyx in any of the flowers of this species which I have dissected, and I cannot find that the ovary has more than a single cell. The disc is deeply divided into 4 fleshy acute lobes, between which the stamens are inserted. The fruit is entirely superior. The genus is closely allied to *Champereia*, which has already been transferred by Messrs. Bentham and Hooker to *Santalaceæ*. It is also allied to *Lepionurus* and *Opilia*; and, with these, it should, in my opinion, be retransferred to the family *Santalaceæ* in which its founder, Jussieu, originally placed it. Wall. Cat. 7537 clearly falls here and not under *Lepionurus sylvestris*. Bl.

7. Lepionurus, Blume.

Shrubby. *Leaves* alternate, shortly petioled, simple, penni-nerved. *Inflorescence* axillary, spicate, with large deciduous bracts, the flowers solitary at the nodes, or in clusters of 3 or 4. *Flowers* monochlamydeous, regular, hermaphrodite. *Perianth* urceolate, the limb 4-parted; lobes valvate, glabrous within. *Stamens* equal in number to

the lobes of the perianth and opposite to them. *Anthers* glabrous. *Staminodes* 0. *Disk* fleshy, yellow, lining the perianth-tube. *Ovary* free, oblong-conical; *stigma* sessile, 4-lobed; *ovule* solitary. *Fruit* drupaceous, glabrous, endocarp crustaceous. *Seed* erect; embryo small, in the axis of fleshy albumen, radicle terete, cotyledons ternate.—Distrib. Species 2, natives of Tropical Asia.

Lepionurus sylvestris, Blume Bijdr. 1148. A glabrous shrub; the branches sub-striate, pale when dry. *Leaves* membranous, oblong, elliptic-oblong or elliptic, shortly acuminate, the base cuneate; main nerves 7 to 9 pairs, rather straight, ascending; length 4 to 6·5 in., breadth 1·4 to 3·5 in., petiole ·15 to ·35 in. *Spikes* axillary, ·5 to 1·25 in. long, solitary, or in clusters of 2 to 6, their rachises filiform, at first enveloped by the large ovate acute, membranous, deciduous bracts. *Flowers* long, the tube inflated and lined by the adherent disc; the lobes deltoid, spreading when mature. *Anthers* and filaments broad. *Fruit* ellipsoid to ovoid, ·35 to ·6 in. long when ripe. Blume Mus. Bot. Lugd. Bat. I, 246; Miq. Fl. Ind. Bat., Vol. I, Pt. I, 284; *Lepionurus oblongifolius*, Mast. in Hook. fil. Fl. Br. Ind. 583; Valeton, Olacineæ, 153. *Leptonium oblongifolium*, Griff. in Calc. Journ. IV, 236. *Opilia acuminata*, Wall. Cat. 7206, also Wall. Cat. 7464.

Malacca, Penang, Perak, rather common. Distrib.—British India, Burma, Malayan Archipelago.

I have not been able to make out, from dissections of dried specimens, the exact attachment of the ovule. But the ripe seed is unquestionably attached to the base of the cavity of the fruit. Whether the ovule was originally erect, or was attached in a pendulous manner, as some botanists assert, from the apex of a short central placenta, I am unable to say. The genus in my opinion is closely allied to *Cansjera*.

8. Ctenolophon, Oliv.

Trees. *Leaves* opposite, petiolate, simple, penni-nerved. *Inflorescence* panicled-cymose. *Flowers* regular, hermaphrodite. *Calyx* 5-parted; lobes imbricate, not accrescent. *Petals* 5, free, imbricate, oblong, reflexed after flowering. *Stamens* 10, free, springing from a short, ring-like, hypogynous disk, those opposite the petals longer than the others; *anthers* roundish, apiculate, 2-celled, dehiscing lengthwise. *Staminodes* 0. *Ovary* free, shortly stalked, imperfectly 2-celled; *style* cylindric, bifid at the apex, stigmas capitate; *ovules* in pairs in each cell, collateral, pendulous. *Fruit* coriaceous or crustaceous, 1-celled, 1-seeded, dehiscing irregularly. *Seed* pendulous from the apex of a free central placenta, and provided with a dorsal pectinate crest.—Distrib. 2 known species, both Malayan.

1. Inflorescence pale-tomentose; flowers ·2 to ·25 in. long ... ... 1. *C. parvifolius.*
2. Inflorescence rusty-tomentose; flowers ·4 in. long ... ... 2. *C. grandifolius.*

1. Ctenolophon parvifolius, Oliver in Trans. Linn. Soc. XXVIII, 516, t. 43. A tree; young branches terete, purplish when fresh, cinereous when dry. *Leaves* opposite, coriaceous, elliptic or oblong-elliptic, entire, shortly and obtusely acuminate, the base cuneate or rounded; upper surface shining, the lower dull, both glabrous; main nerves about 10 pairs, faint, spreading, forming a double series of arches within the edge; length 2·5 to 4·5 in., breadth 1·25 to 2 in., petiole ·3 to ·5 in. *Panicles* terminal and axillary, shorter than the leaves, condensed, minutely cano-tomentose; bracts ovoid-deltoid, minute, deciduous; pedicels stout, about as long as the calyx. *Flowers* ·2 to ·25 in. long, oblong. *Calyx-lobes* sub-rotund, concave, minutely tomentose outside, sub-glabrous inside. *Petals* coriaceous, erect, oblong, concave, four times as long as the calyx, minutely pale tomentose on the back, the imbricate edges and inner surface glabrous. *Anthers* ovate, adnate, much shorter than the filaments. *Ovary* ovoid-globose, woolly, 2-celled, surrounded at the base by an annular disc: *style* long, cylindric, glabrous, 2-furrowed. *Fruit* ellipsoid, slightly obovoid, apiculate, striate, ·6 to ·75 in. long, minutely pale tomentose; the pericarp woody, splitting on one side when ripe. *Seeds* with an imperfect pectinate arillus. Masters in Hook. fil. Fl. Br. Ind. I, 579: Beccari, Malesia I, 120.

Malacca: Maingay (Kew Distrib.), No. 382. Perak: Scortechini, Wray, King's Collector.—Distrib. Borneo, Beccari, P. B., No. 2637, (*fide* Beccari). Sumatra: Forbes, 3002.

2. Ctenolophon grandifolius, Oliver in Trans. Linn. Soc. XXVIII, 517, t. 43, figs. 8 to 10. A tree; the young branches pale, sparsely lenticellate. *Leaves* oblong-elliptic, shortly acuminate, 3·5 to 5 in. long and 1·5 to 1·75 in. broad, otherwise as in *C. parvifolius*. *Panicles* terminal or axillary, almost as long as the leaves, more or less open and spreading, minutely rusty-tomentose; bracts scale-like, caducous; pedicels longer than the calyx. *Flowers* ·4 in. long. *Calyx* and *petals* as in *C. parvifolius*, but rufous- instead of pale-tomentose. *Ovary* as in *C. parvifolius*, but the ovarian cavity shorter. *Fruit* unknown. Masters in Hook. fil. Fl. Br. Ind. I, 577. Beccari, Malesia I, 120.

Malacca: Maingay (Kew Distrib.), No. 383.—Distrib. Borneo. P. B., No. 1966 (*fide* Beccari).

This species is much rarer than the last. In fact I have seen no other specimens than Maingay's. It closely resembles *C. parvifolius* Oliver., the only tangible differences that I can discover (in the absence

of fruit of this), being the greater size of its flowers, and the colour of the tomentum of the flowers and inflorescence which in this is rusty, whereas in *C. parvifolius* it is pale. Professor Oliver relies as a diagnostic mark on a difference in the length of the ovarian cavity; the cavity of the ovary in *C. parvifolius* reaching nearly to the base of the style, whereas in *C. grandifolius* it occupies the base only of the ovary.

9. Ximenia, Linn.

A shrub or low tree. *Branches* spiny. *Leaves* shortly petioled, alternate, simple, 1-nerved. *Flowers* racemose, usually hermaphrodite. *Calyx* cupular, 4– 5-toothed, persistent, not accrescent. *Petals* 4–5, oblong, revolute, hairy within. *Stamens* twice as many as the petals, hypogynous; *anthers* innate, linear, 2-celled. *Staminodes* 0. *Ovary* sessile, superior, 4-celled; *style* columnar, stigma simple; *ovules* solitary in each cell, pendulous, anatropous. *Drupe* ovoid, 1-celled; *stone* solitary.—Distrib. Species, 4–5, 1 Mexican, 1 South African, 1 Bornean, 1 Polynesian, 1 widely dispersed through the Tropics of both hemispheres.

1. Ximenia Americana, Linn. Sp. Pl. 1193. Glabrous, the young shoots striate and lenticellate. *Leaves* coriaceous, oblong-ovate to sub-orbicular, the apex emarginate, the base rounded; length 1 to 2 in., breadth ·75 to 1·25 in. *Racemes* short, axillary, or at the ends of short branches, few-flowered. *Flowers* hermaphrodite or polygamous, ·35 in. long; the buds oblong, acute, bracts minute. *Calyx* much shorter than the petals. *Anthers* linear, erect, the connective thick. *Ovary* ovoid-conical, glabrous. *Style* as long as the stamens. *Stigma* simple. *Fruit* oval, glabrous, about 1 in. long, orange-red when ripe, the pericarp pulpy; *endocarp* bony, 1-celled, 1-seeded. Lamk. Illust. 297, fig. 1; DC. Prod. I, 533; Roxb. Fl. Ind. II, 252; W. and A. Prod. 89; Blume Mus. Bot. Lugd. Bat. I, 247; Miq. Fl. Ind. Bat. I, Pt. 1, 786; Hook. fil. Fl. Br. Ind. I, 574; Pierre For. Flor. Coch. China, x. 265; Kurz For. Flora Burma I, 233; Valeton Olacineæ, 74. *X. Russelliana*, Wall. Cat. 6784.

Malacca, Singapore, Nicobar and Andaman Islands:—Distrib. Malayan Archipelago; Peninsular India.

10. Scorodocarpus, Beccari.

A tall tree. *Leaves* alternate, simple, penni-nerved. *Flowers* dichlamydeous, in short axillary racemes. *Calyx* small, cupular, 4-crenate, not enlarging with the fruit. *Petals* 4 or 5, hypogynous, narrow, valvate, coherent by their edges until mature, lanate internally. *Stamens* twice as many as the petals, attached to them in pairs, dehiscing sutturally, the filaments shorter than the linear elongate erect anthers.

Ovary ovoid, grooved, imperfectly 4- or 5-celled, with 4 or 5 elongated pendulous ovules. *Style* simple, much longer than the ovary; *stigma* minutely-lobed, terminal. *Fruit* globose, 1-celled, the epicarp thin, fleshy, the endocarp crustaceous. *Seed* solitary, globular, pendulous from the apex by a filiform thread (? placenta), embryo near the apex of the fleshy albumen, radicle superior. One species; native of Malaya.

1. Scorodocarpus Borneensis, Beccari in Nuovo Giorn. Bot. Ital. IX, 273. A tall very fœtid tree; branches dark-coloured, lenticellate. *Leaves* coriaceous, elliptic-oblong, acute, the base slightly cuneate or rounded; both surfaces glabrous, the reticulations transverse; main nerves about 5 pairs, curved, ascending, prominent beneath; length 5 to 6·5 in., breadth 2·5 to 3 in., petiole about ·75 in. *Racemes* under 2 in. long, puberulous, the flowers in clusters of 3 or 4. *Calyx* with wavy edge, nearly glabrous. *Buds* oblong; petals puberulous outside, ·3 to ·35 in. long. *Disc* 0. *Fruit* glabrous, 2 in. in diam. Valeton Olacineæ, 88. *Schmidelia fœtidissima*, Wall. Cat. 8064. *Ximinia borneensis*, Baillon Adansonia LXI. 271 (in part).

Singapore: Wallich, Ridley, King. Johore: Ridley. Perak: King's Collector.—Distrib. Borneo.

Rather a common tree, every part of which has a fœtid alliaceous odour. The wood is hard and durable, and is much prized for various purposes. This tree was collected by Wallich in Singapore, and he referred it to *Schmidelia*. The Wallichian specimens, however, were overlooked, and the plant was first described by Baillon from specimens collected by Signor Beccari in Borneo. Subsequently the latter Botanist founded for its reception, the genus *Scorodocarpus*. Its affinities are with *Ximenia*.

11. Anacolosa, Blume.

Shrubs or trees. *Leaves* alternate, petiolate, simple, penni-nerved. *Inflorescence* cymose, axillary. *Calyx* cup-shaped, 5–7-toothed, not accrescent. *Petals* 5–7, oblong, free, valvate, springing with the stamens from a hypogynous or perigynous disk. *Stamens* concealed in the cavity of the petals and slightly adnate to their bases, filaments glabrous, or pilose at the apex; *anthers* broad, innate, 2-celled, dehiscing longitudinally. *Ovary* imperfectly 2- 3-celled below, 1-celled above; *style* cylindric, the stigma shortly lobed; *ovules* 2 or 3, pendulous, the placenta central. *Fruit* drupe-like, with the disc persistent at its apex and the slightly accrescent calyx at its base; *stone* crustaceous, 1- or imperfectly 2-celled, with a single pendulous seed; *embryo* minute at the apex of fleshy albumen, radicle superior.—Distrib. 5 or 6 species, British Indian and Malayan.

Calyx and pedicels glabrous	1. *A. Griffithii.*
Calyx and pedicels minutely rusty-pubescent	
Leaves membranous; young branches glabrous, dark-coloured; anthers with a tuft of hairs in front	2. *A. puberula.*
Leaves coriaceous; young branches thick with pale scurfy bark; anthers very hairy	3. *A. heptandra.*

1. Anacolosa Griffithii, Masters in Hook. fil. Fl. Br. Ind. I, 580. A glabrous shrub or tree; young branches dark-coloured, glaucous. *Leaves* thickly membranous, ovate-lanceolate, sub-acute or acute, the base rounded or sub-cuneate; main nerves 5 or 6 pairs, obscure on both surfaces, curved, spreading; length 2·5 to 4 in., breadth 1·2 to 1·5 in., petiole ·35 in. *Cymes* axillary, few-flowered, sessile or very shortly pedunculate; pedicels longer than the flowers, angled, ebracteolate, glabrous. *Flower-buds* sub-globose. *Calyx* cupular, minutely 5-or 6-toothed, glabrous. *Petals* two or three times longer than the calyx, oblong, obtuse, the upper half thick and fleshy, the lower half concave, hairy towards its upper part, otherwise glabrous. *Stamens* embedded in the concavities of the petals, the filaments short, slender; the anthers sub-globular, hairy in front. *Ovary* conical, flocculent-hairy, tapering into the glabrous style, surrounded at the base by the annular fleshy disk. Kurz For. Flora Burma I, 236; Valeton Olacineæ, 92; Pierre For. Flor. Coch. Chine, t. 266 B.

Burma: doubtfully in the Andaman Islands.

I have seen no specimen of this from the Andamans, but I include it on the authority of the Flora of British India.

2. Anacolosa puberula, Kurz in Jour. As. Soc. Bengal, 1872, Pt. 2, p. 297. A large shrub; young branches glabrous, dark-coloured, all parts except the inflorescence glabrous. *Leaves* membranous, oblong-lanceolate, the apex more or less acute, the base slightly narrowed; main nerves 3 to 5 pairs, distant, ascending, pale and prominent on the lower, faint on the upper surface; length 3·5 to 5·5 in., breadth 1·5 to 2 in., petiole ·3 in. *Cymes* few- or many-flowered, axillary, about as long as the petioles, their rachises conical, woody: pedicels ebracteolate. *Calyx* cupular, with 6 minute distant teeth, rusty-pubescent outside like the pedicels. *Petals* 6, in pairs, oblong, the upper half fleshy; the lower half concave, glabrescent externally, glabrous internally except for a tuft of long hairs at the apex of the concavity. *Stamens* opposite to and as many as the petals, hidden in their concavities; the filaments shorter than the anthers, broad, flat; *anthers* broadly ovoid, tufted, hairy; *disc* large, crenulate, surrounding the base of the conical sub-

glabrous ovary; *stigma* small, minutely lobed. *Fruit* ovoid, glabrescent, ·6 in. long, with the persistent disc at its apex and the slightly accrescent calyx at its base. Kurz For. Flora Burma I, 235: Valeton Olacineæ 93.

Nicobar Islands, Kurz.

Var. *Andamanica.* Leaves ovate-elliptic or ovate-lanceolate, main nerves 4 to 6 pairs, spreading, not pale underneath.

Andaman Islands: King's Collectors.

The specimens on which Kurz founded this species are in the Calcutta Herbarium. They were collected in the Nicobar Islands although Kurz, by a slip, attributes them to the Andamans. These Nicobar specimens are distinguished from all which have, since Kurz's time, been collected in the Andamans (where the plant is very common) by the smaller number of nerves in the leaves, which are, moreover, ascending and pale beneath, whereas these from the Andamans have more numerous nerves which are spreading and are not pale beneath.

3. Anacolosa heptandra, Maing. mss. ex Hook. Fl. Ind. I, 581. A shrub or tree; young branches stout, with pale scurfy bark. *Leaves* coriaceous, oblong-lanceolate, sub-acute at base and apex, glabrous; main nerves 5 or 6 pairs, ascending, obsolete on the upper, rather prominent on the lower surface; length 6 or 7 in., breadth 2·25 to 3 in., petiole ·3 in. *Flowers* in crowded axillary cymes not much exceeding the petioles; *pedicels* short, rufous-pubescent like the calyx, ebracteolate. *Calyx* cupular, with 6 minute distant teeth. The other parts of the Flower as in *A. puberula*, but the ovary narrower, and the anthers more hairy, not merely tufted with hairs. Valeton Olacineæ, 93.

Malacca; Maingay (Kew Distrib.), No. 368.

This species of which I have seen only two specimens (neither of which is in fruit) comes very near to *A. puberula*. The young branches however, are thicker, with paler bark, and have the anthers more hairy than in that species.

12. Platea, Blume.

Trees. *Leaves* entire, coriaceous. *Male flowers* in short axillary interrupted-glomerulose spikes; the females in shorter cymes. *Flowers* polygamo-dicœcious. *Sepals* 5, distinct, imbricate, small. *Petals* 5, united below into a tube, the teeth valvate; in the female deciduous or absent. *Stamens* 5, alternate with the petals and inserted at their bases; the filaments short, *anthers* ovoid, 2-celled. *Ovary in the female flower* cylindric, oblong, obtuse, crowned by the large discoid stigma, 1-celled; the ovules 2, pendulous. *Drupe* baccate, the endocarp woody.

Seed pendulous, the embryo straight, in the axis of the copious albumen.—Distrib. about 4 species; all Malayan.

1. Platea excelsa, Blume Bijdr. 646. A tree 50 to 100 feet high; young branches slender, softly rusty-puberulous. *Leaves* thinly coriaceous, elliptic to oblong, acute or shortly acuminate, the base rounded or very slightly narrowed; upper surface sparsely rufous, puberulous at first, afterwards almost glabrous; lower minutely cinereous-lepidote; reticulations minute, rather distinct and puberulous on both surfaces; main nerves about 7 pairs, spreading, curved, puberulous; length 4·5 to 7 in., breadth 1·75 to 3·5 in., petiole ·5 to ·75 in. *Female flowers* in axillary, 7-or 8 flowered, shortly pedunculate, pubescent, axillary cymes ·5 in. long. *Sepals* ·5 in., broadly ovate, acute, pubescent externally. *Petals* none or early deciduous. *Ovary* cylindric, puberulous; *ovule* (only 1 seen) pendulous, much elongate. *Fruit* narrowly ovoid-ellipsoid, tapering much to the apex, the base rounded 1 to 1·3 in. long, and ·5 in. in diam.; when ripe the pericarp yellowish, thin, glabrous; *endocarp* bony with a few short furrows, *seed* much attenuate at the upper end. Miq. Fl. Ind. Bat. I, pt. 1, 793: Beccari Malesia I, 116: Valeton Olacineæ, 253.

Perak: King's Collector, Wray. Penang: King's Collector, No. 1302. Distrib.—Java.

13. Gomphandra, Wall.

Shrubs or trees. *Leaves* alternate, petioled, simple, penni-nerved, (rarely triple-nerved at the base). *Flowers* polygamo-dicœcious, cymose, (practically unisexual). *Calyx* minute, cupular, 4- 5-toothed. *Petals* 4 or 5, sometimes united and 4-or 5-cleft; often absent in the female flower. *Stamens* 4 or 5, hypogynous, alternate with the petals; *filaments* thick, flattened, hollowed in front, and attenuate at the apex; *anthers* rather small, pendulous from the apices of the filaments, 2-lobed, the dehiscence longitudinal. *Hypogynous disc* thick, annular, or absent. *Male flower* with rudimentary ovary sunk in the fleshy disc, the stigma minute. *Female flower* with long cylindric ovary and large discoid stigma, 1-celled (2-celled in two species), the ovules 2, collateral, pendulous from the apex, the funicle dilated. *Fruit* elongate, drupe-like, surmounted by the remains of the stigma; *pericarp* smooth, thin, *endocarp* leathery. *Seed* solitary, pendulous; *albumen* fleshy, bi-partite; *embryo* minute.—Distrib. 8 or 10 species; Tropics of Asia.

Flowers 4-merous.

Filaments with a large tuft of long white glandular hairs on both surfaces near the apex ... ... 1. *G. comosa.*

Filaments with a few white hairs on the posterior surface.
Cymes axillary or terminal ... 2. *G. lanceolata.*
Cymes extra-axillary or leaf-opposed ... 3. *G. penangiana.*
Flowers 5-merous.
Filaments hairy near the apex.
Cymes on stout short peduncles, ovary hairy, fruit ·8 in. long ... ... 4. *G. nyssifolia.*
Cymes on slender peduncles, ovary glabrous
Pedicels of cymes less than half the length of the leaves; fruit ·25 to ·5 in. long ... ... 5. *G. Maingayi.*
Pedicels of cymes half as long as the leaves; fruit ·65 in. long, imperfectly 2-celled ... ... 6. *G. gracilis.*
Filaments quite glabrous ... ... 7. *G. andamanica.*

1. Gomphandra comosa, King, n. sp. A glabrous tree or shrub, young branches cinereous. *Leaves* thinly coriaceous, oblong to elliptic-oblong, shortly acuminate, much narrowed at the base; main nerves 6 to 8 pairs, sub-ascending, faint; length 3·5 to 6 in., breadth 1·5 to 2 in., petiole ·35 to ·6 in. *Cymes* on slender pedicels about as long as the petioles, umbellulate; cymules 3 to 5, each with 2 to 3 flowers. *Flowers* sessile, ·2 in. long, the buds obovate-globose. *Calyx* shallow, the edge wavy and obscurely 4- or 5-toothed. *Petals* 4, four or five times longer than the calyx, broadly oblong, obtuse, with an inflexed sub-apical point, glabrous. Connective and upper part of filament densely covered with long, white, glandular-pointed hairs. *Ovary* short, ovoid, conic, immersed in the fleshy annular disk, *style* short. *Fruit* narrowly ellipsoid, glabrous, vertically grooved, 1 in. long, and ·4 in. in diam., epicarp thin, endocarp cartilaginous, one-celled, 1-seeded.

S. Andaman; King's Collector's.—Distrib. Java.

The hairs on the filaments are white and very numerous, and they have conspicuous glandular apices. The ovary above described is that found in flowers bearing perfect anthers. It is probable that it aborts, and that fertile ovaries are confined to flowers (as yet undiscovered) in which the stamens are imperfect.

2. Gomphandra lanceolata, King. A shrub 5 or 6 feet high; young branches thin, puberulous. *Leaves* sub-coriaceous, lanceolate or oblong-lanceolate, sometimes very narrow, acuminate, the base cuneate; upper surface glabrous, the lower sparsely puberulous; main nerves about 5 pairs, spreading; the tips ascending, faint; length 2 to 6 in.,

breadth ·4 to 1·5 in., petiole ·15 to ·3 in. *Cymes* axillary and terminal, their pedicels several times as long as the petioles, usually 3, trichotomous; the cymules 3- to 10-flowered, pubescent or glabrescent. *Flowers* sessile, ·15 in. long, buds clavate with truncate apices. *Calyx* cupular, with 3 or 4 small obscure teeth. *Petals and stamens of the male flowers and female flowers* as in G. penangiana. *Lasianthera lanceolata*, Mast. in Hook. fil. Fl. Br. Ind. I, 585. *Stemonurus tomentella*, Valeton (not of Beccari) Olacineæ, 237.

Malacca: on Mount Ophir, Griffith. Perak: King's Collector, Wray, Scortechini, common.

This is rather a variable species as regards the form of leaf and the amount of pubescence on the inflorescence, but the characters of the flowers are constant. For two of the best-marked of these forms I propose varietal names as below.

Var. *angustifolia*, King: *leaves* narrowly oblong-lanceolate, 2 to 6 in. long, and ·4 to ·7 in. broad: *fruit* ovoid with a long apiculus, also contracted at the base, ·5 in. long. Wall. Cat. *Olacineæ*, No. 7570.

Singapore, Wallich. Penang, Curtis, Nos. 737 and 1265. Perak: Scortechini, King's Collector, No. 4211.

Var. *triplinervis*, the two lower lateral main nerves bold and continued nearly to the apex of the leaf.

Perak; Scortechini, No. 375.

3. Gomphandra penangiana, Wall. Cat. 7204. A glabrous or subglabrous shrub 3 to 8 feet high; young shoots thin, pale. *Leaves* shortly membranous, oblong, oblong-lanceolate or elliptic, shortly acuminate, the base cuneate; main nerves 5 to 9 pairs, spreading or ascending, slightly prominent; length 4·5 to 7 in., breadth 1·5 to 2·75 in., petiole ·25 to ·35 in. *Cymes* extra-axillary or leaf-opposed, pubescent, trichotomous, spreading, many-flowered, their peduncles longer than the petioles, erect. *Flowers* ·15 in. long, on short glabrous or pubescent pedicels. *Calyx* a shallow glabrous cup with 3 or 4 obscure broad teeth. *Corolla* in bud cylindric-clavate, the apex truncate, four or five times as long as the calyx, glabrous. *Petals* 4, oblanceolate (the apex inflexed), hyaline. *Filaments* flat, thick, tapering to each end, with a tuft of few long pale glandular hairs near the apex behind the insertion of the anther. *Rudimentary ovary* narrowly ovate, small, half-immersed in the deep fleshy lobed disk. *Cymes of female flowers* longer than the males, secund; *calyx* as in the male: *corolla* absent. *Ovary* elongate, cylindric, glabrous, crowned by a large discoid *stigma* wider than itself, one-celled with 2 elongated ovules pendulous from the apex. *Fruit* ovoid or elliptic, constricted at base and apex, vertically ridged, glabrous, crowned by the persistent stigma, ·5 to ·7 in. long. Masters in

Hook. fil. Fl. Br. Ind. I, 587. *Stemonurus penangianus*, Miers Contrib. I, 90; Kurz For. Flor. Burm. I, 238. Wall. Cat. 3718. *G. axillaris* (in part).

Penang; Wallich, Curtis. Perak; Scortechini, King's Collector, Wray; very common.

4. Gomphandra nyssifolia, King. A tree 15 to 40 feet high; young branches dark-coloured, slightly winged under the nodes. *Leaves* coriaceous, elliptic-ovate, abruptly and shortly acuminate, the base cuneate; main nerves rather straight, ascending, prominent on the lower surface, the transverse veins distinct, ovary sub-horizontal; length 3·5 to 5·5 in., breadth 2 to 2·5 in., petiole ·3 in. *Cymes* axillary, sometimes 2 together, their pedicels shorter than or as long as the petioles; flowers 4 to 6, sessile, ·25 in. long. *Female flower*: calyx cupular, with 5 minute distant teeth or sub-entire; *petals* 5, puberulous outside, 5 or 6 times as long as the calyx. *Filaments* flat, with a few white short hairs just below the anther, especially in front. *Disk* adherent to the base of the ovary, glabrous. *Ovary* cylindric, as long as the petals, puberulous, crowned by the large discoid lobed stigma. *Fruit* ellipsoid, slightly clavate, glabrous, ridged, crowned by the persistent stigma, ·8 in. long, and ·35 in. in diam.

Perak: Scortechini, King's Collector, Nos. 6406 and 6984.

I have not seen the true male flowers of this species.

5. Gomphandra Maingayi, King. A glabrous shrub 4 to 6 feet high; young branches rather stout, dark-coloured, glabrous. *Leaves* subcoriaceous, oblong-lanceolate and acuminate, or sub-rhomboidal acute, the base cuneate; main nerves 5 or 6 pairs, rather straight, ascending, prominent beneath; length 2 to 3·5 in., breadth ·9 to 1·2 in., petiole ·25 in. *Peduncles* longer than the petiole, slender; *cymules* 2 or 3, umbellulate, each 4- to 5-flowered. *Flowers* ·15 in. long, sessile. *Calyx* cupular, tomentose, with 4 or 5 shallow teeth. *Petals* 5, four or five times as long as the calyx, rather thick, oblong, sub-acuminate, the apex inflexed, the midrib dark. *Filaments* pointed at the apex and with small tufts of long white sub-apical hairs; *anthers* pendulous from the apex of the filaments. *Rudimentary ovary* and disk absent. *Female flower* unknown. *Fruit* (*fide* Masters) ovoid, ·25 to ·5 in. long, 1-celled, 1-seeded. *Stemonurus Maingayi*, Valeton Olacineæ, 236. *Lasianthera Maingayi*, Mast. in Hook. Fl. Br. Ind. I, 585.

Malacca: Maingay (Kew Distrib.), No. 374[2]. Penang: Curtis.

Known only by Maingay's and Curtis's scanty specimens. It is possible that under these there may really be two species: for Maingay's specimens divide themselves into two sets; one with sub-rhomboid acute leaves which bear the flowers described above; the other with narrowly

oblong-lanceolate leaves and which have neither flowers nor fruit. It is possible that the second set belong to an undescribed species.

6. Gomphandra gracilis, King, n. sp. A glabrous shrub or small tree; young branches thin, pale. *Leaves* membranous, lanceolate or ovate-lanceolate, acuminate, the base much narrowed, the edges slightly recurved when dry, wavy and sub-crenulate; main nerves 6 or 7 pairs, spreading, faint. *Peduncles* axillary and terminal, nearly half as long as the leaves; the cymes trichotomous, compound, the ultimate cymules umbellate. *Male flowers* ·1 in. long, the buds sub-globular; *Calyx* cupular, shallow, with 5 minute teeth; *petals* 5, oblong, glabrous, reflexed, 4 or 5 or 6 times as long as the calyx. *Filaments* 5, thin, flat, attenuate upwards, bearing a tuft of white bulbous-pointed hairs below the small anther. *Female flower* with calyx and abortive stamens like the male, the petals (if any) deciduous. *Ovary* long, cylindric, glabrous, crowned by the large pileate stigma, 2-celled, one of the cells usually empty, the other with a single long ovule suspended from its apex. *Fruit* ellipsoid, flat on one side, curved, glabrous, striate, about ·65 in. long, imperfectly 2-celled and with a single pendulous seed.

Perak: Wray, King's Collector; common.

A species readily distinguished by its small flowers globular in bud, and by its curved imperfectly 2-celled fruit.

7. Gomphandra andamanica, King. A tree; young branches tawny-puberulous. *Leaves* thinly coriaceous, oblong or elliptic, shortly and rather abruptly acuminate, the base round or narrowed, sometimes oblique; main nerves 8 or 9 pairs, curved, ascending, prominent beneath and depressed above when dry; length 5 to 8 in., breadth 2 to 3 in., petiole ·4 to ·6 in. *Cymes* in the axils of leaves or of fallen leaves, often 2 together, ·5 to ·8 in. in diam., many-flowered, dense, rusty-pubescent, their peduncles stout and ·4 or ·5 in. long. *Flowers* nearly ·15 in. long, sessile, globose-obovate in bud. *Calyx* cupular, thin, irregularly and minutely 4–5-toothed, tomentose externally, and glabrous internally like the petals. *Petals* 5, oblong-oblanceolate, spreading, the apices curved, three times as long as the calyx. Male flowers: *stamens* 5, as long as the petals, free, the filaments quite glabrous; *disk* hypogynous, fleshy, embracing the base of the narrowly ovoid small rudimentary ovary. *Female flower:* calyx as in the male; petals and stamens not seen; *ovary* narrowly ellipsoid, with a short constriction at the apex, stigma disciform. *Fruit* compressed-ellipsoid, about 1 in. long, slightly convex on one side, deeply grooved on the other; the pericarp glabrous, vertically striate, thin; the endocarp leathery, 2-celled, one cell without a seed, and divided by vertical false dissepiments into several chambers, the other cell occupied by a single pendulous flat seed

bent vertically on itself at right angles. *Apodytes andamanica*, Kurz, Journ. As. Soc. Bengal, 1872, II, 296; Hook. fil. Fl. Br. Ind. I, 587.

Andaman and Nicobar Islands; Kurz. Narcondam Island; Prain.

This species was published as an *Apodytes* by Kurz. The stamens ovary and fruit however are exactly those of *Gomphandra*, to which genus I therefore transfer it. In *Apodytes* the stamens have long narrow anthers and short filaments, while the style is oblique and excentric, more or less curved, and the stigma small, the fruit being more or less orbicular or reniform with the scar of the stigma lateral.

14. Lasianthera, Pal. de Beauv.

Trees or shrubs, sometimes scandent. *Leaves* alternate, simple, penni-nerved, coriaceous. *Flowers* dichlamydeous, bisexual, in stalked axillary cymes. *Calyx* minute, cupular, 4- or 5-lobed. *Petals* 5, free or rarely cohering, the apex inflexed. *Stamens* 5, hypogynous, free, alternate with the petals; the filaments flat, broad, the connective dilated behind and bearing a tuft of long hairs curving over the anther in the bud; *anthers* adnate, 2-lobed, dehiscing lengthwise. *Hypogynous disk* cup-shaped, more or less corrugated. *Ovary* ovoid, 1-celled, tapering into a subulate style, terminated by a minute stigma; *ovules* 2, pendulous. *Fruit* drupaceous; *stone* fibrous outside, woody within. *Seed* pendulous; *embryo* in albumen, cotyledons leafy and broad, radicle superior.—Distrib. Species 4, one African, the others Malayan.

The genus *Stemonurus*, as originally constituted by Blume in 1825, contained three species. One of these has been referred by Messrs. Bentham and Hooker to the older genus *Lasianthera*, which was founded by Palisot-Beauvois in 1805; while the other two species of Blume, *viz.*, *S. parviflorus* and *S. javanica*, have been placed in the genus *Gomphandra* Wall. as defined by Lindley (Nat. Syst. Ed. II, p. 439).

This arrangement is not, however, accepted by all botanists who have written concerning these genera. Miers (Contrib. I, 80) for example considers *Gomphandra* Wall. and *Stemonurus*, Bl. as identical, and both as undistinguishable from *Lasianthera*, Pal-Beauv.; while Beccari (Malesia I, pp. 107, et seq.) keeps up all three genera, and in this, he is followed by Valeton (Olacineæ pp. 207, et seq.). M. Baillon, like Miers, includes the other two in *Lasiandra* which however he places in the natural family *Terebinthaceæ*. Dr. Masters (in Hooker's Flora of British India) follows Messrs. Hooker and Bentham, and I do so also. I have, however, modified the generic characters of *Lasianthera* and *Gomphandra*, and I have not followed Dr. Masters altogether in his allocation of the species. I find the best characters to distinguish *Gomphandra* from *Lasianthera* to be these:—*Lasianthera*, flowers truly hermaphrodite, stigma minute,—*Gomphandra* flowers practically unisexual, the stameniferous flowers having rudimentary ovaries and the seed-producing flowers having large cylindric ovaries with large discoid stigmas, and usually abortive stamens.

Ultimate branches of the inflorescence scorpoid cymules 1·5 in. or more in length ... 1. *L. secundiflora.*
Ultimate branches of the inflorescence about ·25 in. long.
Leaves cuneate-obovate ... ... 2. *L. umbellata.*
Leaves elliptic-oblong or elliptic-acuminate ... ... 3. *L. malaccensis.*

1. Lasianthera secundiflora, Miq. Fl. Ind. Bat. I, Pt. I, 792; Suppl. 342, t. 2, pp. 43 and 403. A glabrous tree 40 to 60 feet high; young branches stout, dark-coloured. *Leaves* coriaceous, elliptic or ovate-elliptic, very shortly and bluntly acuminate or obtuse, the base rounded or narrowed; the midrib prominent on the lower surface, depressed on the upper; main nerves about 10 pairs, ascending, curving slightly, not much more prominent when dry than the secondary nerves and wide reticulations; length 5 to 10 in., breadth 2·25 to 4 in.; petiole ·5 to ·75 in., stout. *Peduncles* solitary, longer than the petioles, woody, each bearing at its apex an umbel of 6- to 9-flowered secund subscorpoid cymes. *Flowers* sessile, ebracteate, ·25 in. long. *Calyx* short, puberulous. *Petals* glabrous, four or five times as long as the calyx, oblong, sub-acute, each bearing a fleshy conical inflected process slightly below the apex. *Filaments* flattened, tapering to the base; the connective thick, bearing a dense tuft of white hairs as long as the stamen. *Ovary* furrowed, shorter than the stamens but longer than the style. *Fruit* narrowly ellipsoid, 2·5 in. long, and 1 in. in diam., tapering to each end, glabrous, vertically grooved; epicarp thin, mesocarp fibrous, endocarp thin and bony; embryo half as large as the albumen, cotyledons foliaceous, cordate, radicle superior. *Stemonurus secundiflorus*, Blume Bijdr. 649; Mus. Bot. Lugd. Bat. I, t. XLV; Beccari, Malesia, Vol. I, t. IV, figs. 16 and 17; Valeton, Olacinæ 234.

Singapore, Johore: Ridley. Perak: King's Collector, Wray. Distrib.—Java, Sumatra.

2. Lasianthera umbellata, King. A glabrous tree 50 to 60 feet high (or a shrub *fide* Beccari); young branches cinereous, terete. *Leaves* coriaceous, cuneate-obovate, the apex rounded or slightly retuse, much narrowed to the base, midrib prominent beneath; main nerves 7 to 9 pairs, ascending, faint; length 2·5 to 3·5 in., breadth 1·25 to 1·8 in., petiole ·5 to ·7 in. *Cymes* longer than the petioles, umbellulate; the 4 to 6 cymules each with 4 or 5 flowers. *Flowers* sessile, ·15 in. long, broad, truncate. *Calyx* nearly half as long as the petals, pubescent, coriaceous, the edge with 5 broad rounded teeth. *Petals* subcoriaceous, elliptic, obtuse at each end and with an inflexed process below the apex, puberulous outside, glabrous inside. *Filaments* attenuated

towards the base. Connective of anthers everywhere densely silky-comose, the anther lobes separated. *Ovary* globose-ovoid, tapering into the short style, 1-celled. *Disk* thin, hyaline, enveloping the base only of the ovary. *Fruit* unknown. *Stemonurus umbellatus*, Beccari, Malesia, I, 115; tav. XV, pp. 5, 6. *Stemonurus intermedius*, Scort. MSS. in Herb. Calc.

Perak: King's Collector, Scortechini.—Distrib. Borneo.

3. Lasianthera malaccensis, Mast. in Hook. fil. Fl. Br. Ind. I, 584. A glabrous tree 30 to 40 feet high; young branches cinereous, terete, glabrous. *Leaves* coriaceous, elliptic-oblong to elliptic, shortly and abruptly acuminate, the base narrowed, midrib prominent on the upper, depressed on the lower surface; main nerves about 10 pairs, straight, sub-ascending, faint on both surfaces; length 3 to 4·5 in., breadth 1·2 to 2·25 in., petiole ·3 or ·4 in. *Cymes* slightly longer than the petioles, dichotomous, 8- to 10-flowered. *Flowers* sessile, ebracteate, ·2 in. long. *Calyx* with 5 acute teeth, puberulous. *Petals* 3 or 4 times as long as the calyx, otherwise as in *L. secundiflora*. *Filaments* with a small tuft of hairs in front, otherwise as in *L. secundiflora*. *Fruit* unknown. *Stemonurus capitatus*, Beccari, Malesia, I, 114, tav. XV, figs. 7 to 11; Valeton, Olacineæ, 236.

Malacca: Maingay (Kew Distrib.), No. 385. Penang: Curtis, Nos. 912, 957. Perak: King's Collector, Scortechini.

This species has smaller leaves and different cymes from *L. secundiflora*, but the flowers of the two are very much alike.

15. Gonocaryum, Miq.

Trees. *Leaves* alternate, simple, penni-nerved, coriaceous. *Flowers* in long axillary spikes, dimorphous. *Calyx* of 5 free, ovate, imbricate sepals. *Corolla* much longer than the calyx, gamopetalous, tubular, with 5 acute spreading short teeth, slightly inflexed at the very apex, and valvate in æstivation. *Stamens* 5, alternate with the teeth of the corolla, the filaments adherent to its tube, free only towards the apex *anthers* sub-exserted, alternate with the teeth, oblong, bilocular, dehiscing longitudinally. *Ovary* ellipsoid, seated on the glabrous annular disk, minute, bilocular, the cells (unequal?), uniovulate, the ovule pendulous. *Style* 1, very short, the stigma apical. *Drupe* dry, spongy, 4-gonous, ridged, narrowed to each end, crowned by the small incurved style and stigma; the calyx persistent at its base but not enlarged, 2-celled, the obsolete second cell being represented by a cylindrical cavity in the spongy mesocarp; the epicarp membranous, sub-glabrous in its upper half, puberulous towards the apex; endocarp papery, with a few minute

scattered hairs. *Seed* solitary, flattened, the abortive seed very small, both pendulous.

The genus *Gonocaryum* was first published by Miquel in his Fl. Ned. Ind. Suppl. p. 343, to receive the single species *G. gracile*. The generic description is incomplete as regards the structure of the seed, but the specimens with which the author worked have no seeds. I have had an opportunity of carefully examining these specimens and I find that Miquel's description is, as regards the structive of the ovary which is found in the staminferous flowers, inaccurate. He describes two styles and stigmas, whereas, I can find only one of each. And to this extent, I have modified as above the generic description. I think it highly probable however, that fertile ovaries occur (as in so many members of this family) in distinct flowers, and that these may possibly have two stigmas like *Pteleocarpa* and *Cardiopteris*. Of such flowers however, there is no trace in the scanty materials on which Miquel founded the genus. There are two fruits however on one of the type specimens, and a transverse section of these shows a vertical cavity in the substance of the thick mesocarp on one side which has all the appearance of an aborted loculus. The single perfect seed which has filled the loculus, is too much decomposed for examination. In their *Genera Plantarum*, Messrs. Bentham and Hooker remark (in a note), that they have seen no specimen of *Gonocaryum* Miq. And without admitting it as a genus of *Olacineæ*, they quote Miquel's genera description. The late Mr. S. Kurz, in a note in Journ. As. Soc. Bengal for 1870, Pt. 2, p. 72, propounded the view that *Phlebocalymna* Griff. MSS., as described by Messrs. Bentham and Hooker (Genera Plantarum I, 353) is identical with *Gonocaryum*. Kurz, who had examined the specimens on which Miquel founded *Gonocaryum*, also believed Miquel to be wrong about the cells of the ovary; for he states that "the ovary is really one-celled and, to judge from the sterile fruits, 2-ovuled." The abortive seed in the fruit which Kurz examined was, he continues "suspended from the apex just beneath the acumen, and there can be observed also the rudiment of the second superposed ovule." But Kurz entirely overlooked the cylindrical cavity of the abortive loculus. Dr. Scheffer in (Ann. Jard. Bot. Buitenzorg I, 96), published a note on the genera *Gonocaryum* and *Phlebocalymna*, of neither of which had be seen (as he states) good or authentic specimens. In that paper Dr. Scheffer follows Kurz in reducing *Phlebocalymna* to *Gonocaryum*. Scheffer gives also a definition of *Gonocaryum* which differs a good deal from Miquel's. And he describes two new species of this modified *Gonocaryum* (viz., *G. Teysmannianum* and *G. pyriforme*). I have examined the latter, and I do not find it to be a *Gonocaryum* at all, as Miquel defined the genus. Beccari (Malesia I,

122) follows Scheffer, adopts his modified definition of *Gonocaryum*, and adds two new species *viz.*, *G. Selebicum*, and (at p. 256), *G. affine*. In my opinion *Gonocaryum* and *Phlebocalymna* are not identical.

The flowers of the two species *P. Griffithiana* and *P. Lobbianum* (which are accepted as constituting the genus *Phlebocalymna*) have the calyx gamosepalous, deeply 5-lobed, the petals only twice as long as the calyx, fleshy, cohering by their edges, but quite separable from each other, their apices fleshy and inflexed; the buds being shortly cylindrical and obtuse, and the fruit elliptic (not 4-gonous), slightly striate, obtuse at each end with a bony (not spongy) and strictly 1-celled endocarp, and there being no trace whatever of an abortive loculus. If the definition of the genus *Phlebocalymna* be amended in these particulars to it certainly belongs *G. pyriforme*, Scheff. And, judging from the description, (for I have not seen specimens) *G. Teysmannianum* Scheff. and *G. Selebi* Becc., with almost equal certainty belong to *Gonocaryum*. About the allocation of *G. affine*, Becc., the description in Malesia I, 256, is too incomplete to enable me to form an opinion.

Racemes 5 to 12 in. in length, flowers ·2 in. long. ... ... 1. *G. longe-racemosum.*

Racemes under 3 in. long: flowers ·1 in. long 2. *G. gracile.*

1. Gonocaryum longe-racemosum, King, n. sp. A small glabrous tree. *Leaves* coriaceous, elliptic-oblong, shortly acuminate, the base slightly narrowed; main nerves about 4 pairs, ascending, prominent on the lower, depressed on the upper surface, length 5 to 7 in., breadth 2·25 to 3·5 in., petiole ·3 to ·5 in. *Racemes* axillary or from the stem and larger branches, puberulous, slender, 5 to 12 in. long. *Flowers* ·2 in. long, irregularly disposed on the rachis, sometimes in pairs; their pedicels ·1 in. long, pubescent. *Sepals* 5, ovate, imbricate, puberulous. *Corolla* tubular, the teeth small and recurved. *Fruit* obovoid-elliptic, with 4 very bold vertical ridges and numerous striæ, 1·5 to 2 in. long, and 1 in. in diam., glabrescent; *mesocarp* very thick, spongy, distinctly 2-celled, the aborted cell narrowly cylindric.

Singapore; Hullett, No. 851; Ridley, No. 4750. Perak; King's Collector, Nos. 7397, 7663; Scortechini.

2. Gonocaryum gracile, Miq. Fl. Ind. Bat. Suppl. 343. A shrub? *Leaves* as in the last, but slightly obovate. *Racemes* under 3 in. in length, and the flowers only about ·1 in. long, fruit 1·5 in. long. Kurz in Journ. As. Soc. Beng. for 1875, II, 155; For. Flora Burma, I, 240. *G. Wallichii*, Mast. Fl. Br. Ind. I, 590; Beccari, Malesia, I, 122; Valeton Olacineæ, 245: *Platea Griffithiana*, Miers Contrib. I, 97, (*not Phlebocalymna*, Griff). *Gonocaryum? Wallichii*, Mast. in Hook. fil. Fl. Br. Ind. I, 590 (note).

Andamans or Tenasserim; *Helfer* (Kew Distrib.), No. 817.—Distrib. Sumatra; Lebong Moesie, Teysmann.

I include this species here although it is not clear whether Helfer's specimen was collected in the Andamans or in the Tenasserim Province of Burmah. This differs from *G. longe-racemosa* by its shorter more slender racemes, and much smaller flowers. Other differences will no doubt be found when both plants are properly collected. At present the materials of *S. gracile* are very poor indeed. They are, however, sufficient to demonstrate that the plant so long known as *Phlebocalymna Griffithii* does not belong to the same genus as the specimens on which Miquel founded his genus *Gonocaryum*.

16. Phytocrene, Wall.

Climbing shrubs, usually more or less hairy, often prickly; wood with very large porous vessels and thick medullary rays, but no annual rings. *Leaves* alternate, petiolate, entire or palmately-lobed. *Flowers* dicœcious, monochlamydeous; male in small globose clusters borne on long branching spikes; female in large solitary globose pedunculate heads. *Male flowers* each with an involucre of 3–5 free pieces; the perianth single, of 4 pieces, free, or united below and deeply 4-lobed, valvate. *Stamens* as many as the pieces of the perianth and alternate with them, the filaments hypogynous; *anthers* 2-celled, introrse, dehiscing longitudinally; *pollen grains* globose, the rudimentary pistil small. *Female flowers* without involucels; the perianth as in the males, more or less persistent in the fruit; *staminodes* minute, tooth-like, as many as the pieces of the perianth, or absent. *Pistil* sessile, 1-celled, villous; *style* thick, tapering; *stigma* large, sub-capitate or discoid, lobed or emarginate; *ovules* 2, collateral, suspended from near the apex of the cavity, raphe dorsal, *micropyle* superior. *Drupes* many, in globose heads, bristly or echinate; *stone* hard, 1-celled, 1-seeded, pitted externally. *Seed* pendulous; *embryo* as long as the fleshy albumen; radicle superior, short; cotyledons large, flat, appressed.—Distrib. Species 8, all natives of India and the Malayan Archipelago.

There is a difference of opinion as to the nature of the organs at the base of the flowers, some authors regarding them as a calyx, while others (e. g. Baillon) regard them as bracteoles. I adopt the latter view, chiefly because these bodies are not isomerous with the inner whorls of the perianth (corolla of some) or with the stamens. A further argument for considering them as bracteoles is found in the allied genus *Miquelia*, in the males of which similar organs are found, and where they are separated from the flower by a long pedicel.

Leaves entire	...	1. *P. oblonga.*
Leaves ovate, sometimes 3-lobed	...	2. *P. bracteata.*
Leaves deeply palmately 5-lobed	...	3. *P. palmata.*

1. PHYTOCRENE OBLONGA, Wall. Pl. As. Rar. III, 12. Bark brownish, rather rough, striate, not prickly, that of the younger branches puberulous. *Leaves* coriaceous, oblong or oblong-lanceolate, more or less acuminate, entire, the base narrowed; upper surface glabrous, shining, the lower minutely pubescent, minutely lepidote, the reticulations very distinct; main nerves 7 to 9 pairs, curved, ascending, prominent on the lower surface; length 4·5 to 9 in., breadth 2 to 3·5 in., petiole ·6 to 1 in. *Panicles of male flowers* axillary, or clustered on woody warted tubercles on the stem and larger branches, 1 to 2 in. long, and from ·4 to ·5 in. broad, the ultimate branches consisting of minute pedicellate umbellules; the pedicels of the umbellules ·15 in. long, rusty-tomentose, each with a subulate bract shorter than itself. *Flowers* sessile, ·05 in. long, in 4- or 5-flowered umbellules ·15 in. in diam. *Bracts of involucel* free, narrowly deltoid, rufous-sericeous. *Pieces of the perianth* 4, free, ovate, concave, glabrous inside, rufous-sericeous externally. *Stamens* shorter than the perianth, anthers broad. *Rudimentary ovary* minute, sericeous. *Female flowers* in shortly pedunculate globular capitula, ·5 in. in diam., borne on the stem and branches, the peduncle stout, ·25 in. long. *Drupes* cuneate-ovoid, obtuse, 1·5 in. long, and 1 in. in diam.; the base pointed trigonous and strigose; the rest of the surface densely covered with very stout asperulous pale brown bristles, collected in globular heads, the size of a cricket-ball; epicarp leathery, mesocarp pulpy, endocarp crustaceous. *Seed* solitary; cotyledons thin, tortuous, embedded in lobulated fleshy albumen. Baill. in DC. Prod. XVII, 13; Hook. fil. Fl. Br. Ind. I, 592; Wall. Cat., No. 4948. *Gynocephalum oblongum*, Trec. in Ann. Sc. Nat. Ser. 3, VIII, 149.

Penang; Wallich. Malacca; Maingay. Perak; Scortechini, King's Collector.

The female flowers are often diseased, and the petals are converted into a long fleshy tube which contains no trace of ovary.

2. PHYTOCRENE BRACTEATA, Wall. Pl. As. Rar. III, 12. Stems with sharp tubercles; branches striate, minutely prickly when young. *Leaves* coriaceous, broadly ovate, cordate at the base, often 3-lobed and obscurely dentate, the apex acute, upper surface glabrous, the nerves pubescent; lower surface pale, softly and minutely pubescent, reticulations distinct especially on the lower surface; main nerves 4 or 5 pairs, spreading, curved, prominent beneath; length 4 to 8 in., breadth 3 to 5·5 in.; petiole 1·25 to 3 in., minutely tomentose with bristles intermixed. *Panicles of male flowers* bracteate, axillary, 4 to

8 in. long, and from ·75 to 1·25 in. broad; the ultimate branches consisting of minute clustered, 6- to 10-flowered, pedicellate umbellules; *bracts* from the bases of the pedicels of the umbellules, ·4 or ·5 in. long, subulate, curved, hispid. *Flowers* sessile, ·05 in. in diam. *Bracteoles of the involucel* 3, deltoid, their apices broad and bifid, glabrous on the inner, densely villose on the outer surface. *Pieces of the perianth* 4, free, ovate-lanceolate, acute, smaller than the sepals, valvate. *Stamens* shorter than the perianth, the anthers broad. *Rudimentary ovary* minute, villous. *Female flowers* (*fide* Griffith) in oblong or spherical pedunculate capitula of which there are several in a leaf-axil. *Style* short, tri-partite; the segments revolute, stigmatiferous on the inner surface. *Ovary* strigose, 1-celled, with 2 pendulous ovules. *Drupes* ovoid, tapering to each end, densely covered with adpressed yellowish bristles, 1·5 in. long, and ·75 in. in diam., 1-celled, crowded in dense pendulous globose capitula as large as a man's head. *Seed* solitary, albumen fleshy, radicle broad; cotyledons small, orbicular. Baill. in DC. Prod. XVII, 12; Hook. fil. Fl. Br. Ind. I, 592; Kurz For. Flora Burmah I, 242; Beccari Malesia, I, 127: Wall. Cat. No. 4947. *P. macrocarpa*, Griff. Notul. IV, 322: Ic. Pl. Ind. Or. 487 and 488. *Gynocephalum bracteatum*, Trec. in Ann. Sc. Nat. Ser. 3, VIII, 149, No. 3.

Penang; Porter, Curtis. Malacca; Griffith. Perak; King's Collectors. Singapore; Maingay, Ridley.—Distrib. Borneo.

3. Phytocrene palmata, Wall. Pl. As. Rar. III, 12. Stem minutely prickly; the younger branches rufous-hispid, striate. *Leaves* coriaceous, reniform, deeply 5-lobed; the lobes oblong, acuminate or acute; upper surface glabrous, the lower densely covered with soft course rufous or yellowish hairs; main nerves 5 to 7, palmate, prominent on the upper, depressed on the lower surface; length 7 to 12 in., breadth about the same; petioles 3 to 5 in., densely ferruginous-pilose. *Panicles of male flowers* axillary, 2·5 to 13 in. long, and about 1·5 in. broad, the ultimate branches consisting of minute 12- to 15-flowered, pedicelled, ebracteate umbellules; pedicels ·15 in. long, softly pubescent. *Male flowers* as in *P. oblonga*. *Female flowers* in shortly pedunculate axillary ovoid capitula, ·5 in. in diam.; the peduncle ·25 in. long, pilose. *Flowers* ·2 in. long, sessile. *Bracteoles of the involucel* of two deltoid bifid pieces: *corolla* 0. *Ovary* ovoid, pointed, densely hirsute. *Drupes* numerous, ellipsoid, slightly obovoid, tapering much to the base, the apex acute, the whole surface more or less densely covered with yellowish shining stiff hairs; 1·5 to 2 in. long, and ·75 in. in diam., collected in sub-globular heads 3 or 4 in. in diam., Baill. in DC. Prod. XVII, 11; Miq. Ann. Mus. Lugd. Bat. III, 248; Hook. fil. Fl. Br. Ind. I, 592; Beccari Malesia, I, 127. *Gynocephalum palmatum*, Trec. in Ann. Sc. Nat. Ser. 3, VIII, 149: Wall. Cat., 4949.

Penang; Wallich, Curtis. Malacca; Griffith. Perak; King's Collector, Wray.

17. Miquelia, Meissner.

Climbing shrubs, the wood with large vessels. *Leaves* alternate, simple, entire or dentate, petiolate, penni-nerved. *Flowers* dicœcious, the males pedicellate and in clustered umbels, the females sessile and in solitary capitula. *Male flowers* each on a long pedicel with a whorl of minute bracteoles at its base. *Perianth* 5-merous, the pieces oblong or lanceolate, free or united at the base, valvate. *Stamens* equal to the pieces of the perianth and alternate with them; filaments short, anthers linear-oblong, 2-celled, introrse, disk 0. *Rudimentary pistil* small. *Female flowers*;—bracteoles as in the male, sometimes united by their bases. *Flowers* sessile, the perianth deeply divided into 4 fleshy lanceolate reflexed segments. *Disk* none. *Ovary* solitary, compressed, crowned by the large discoid stigma, 1- celled, with 2 pendulous collateral ovules, raphe dorsal, radicle superior. *Drupe* oblong, more or less compressed, the calyx persistent at its base, the mesocarp thin; the endocarp crustaceous, rugose externally, often verrucose internally. *Seed* suspended, solitary, with thin testa, albumen fleshy rugulose, radicle superior; cotyledons elliptic, thick, leafy. Species about 5 Indian and Malayan.

1. Miquelia caudata, King, n. sp. A slender climber 10 to 20 feet long; branches thin, pale, striate. *Leaves* membranous, oblong-lanceolate, shortly acuminate, the base narrowed; upper surface glabrous, the lower puberulous especially on the midrib and 5 or 6 pairs of spreading, curving, ascending or spreading main nerves; length 5 to 8 in., breadth 1·5 to 2 in., petiole ·5 to ·65 in. *Umbels of male flowers* ·65 to 1 in. long, in fascicles from pilose tubercles on the stem, axillary or extra-axillary. *Bracteoles of involucel of each flower* 4 or 5, free or united at the base, lanceolate, pilose. *Pedicels of flower* ·15 to ·2 in. long, pubescent. *Flowers* ·15 in. in diam., the segments of the perianth spreading, puberulous; *filaments* shorter than the linear-oblong sagittate anthers. *Rudimentary ovary* minute, hirsute. *Capitules of female flowers* ·25 in. long, ovoid, solitary, axillary; their peduncles 2 to 2·5 in. long, puberulous. *Flowers* sessile, ·15 in. in diam.; perianth leathery, glabrous. *Ovary* tomentose; the stigma discoid, depressed in the centre, wider than the ovary, glabrous. *Drupe* broadly ovoid, slightly compressed, rounded and broad at the base, tapering upwards into a long terminal tail crowned by the persistent stigma; epicarp thin, rusty-pubescent on the surface; endocarp bony, rough, and pitted on the outer surface, smooth and tubercled on the inner; length from base to apex 1 to 1·25 in., breadth at base ·6 in.

Perak; Scortechini, King's Collector.

This species is closely allied to *M. Kleinii*, which is a common plant in the forests at the base of the Assam Hill Ranges. This differs from *M. Kleinii* chiefly in its fruit having a long apical tail which is quite absent in the former. The male flowers also differ in the two species. The genus *Miquelia* was founded by Meissner (*Plant. Vasc. Genera*); but Griffith, over-looking Meissner's description, published *M. Kleinii* under the name *Jenkinsia Assamica*, in 1844, in the Calcutta Journal of Natural History, Vol. 4. 231, t. 12. A description and figure of the female flowers are to be found in the same author's *Notulæ*, 370; and a figure in his Icones, t. 537, fig. 2. Wallich issued the Assam plant as No. 6760 of his Catalogue under the name *Zanonia? oblonga*.

18. Sarcostigma, W. and Arn.

Climbing shrubs. *Wood* without zones. *Leaves* alternate, simple, shortly petioled, much reticulate *Flowers* dicœcious, minute, arranged in glomeruli along a long pendulous rachis. Male fl.: *Calyx* minute, cupular, 4–5 lobed. *Petals* 5, free, or nearly so, valvate, oblong, ultimately reflexed. *Stamens* 5, alternate with the petals, free, or adnate to the base of the petals, filaments glabrous; *anthers* ovate, sagittate, erect, 2-celled, dehiscing longitudinally. *Pistil* rudimentary. Female fl.: *Calyx* and *corolla* as in the male, but shorter and more fleshy. *Staminodes* 4–5, hypogynous, alternate with the petals. *Ovary* superior, sessile, 1-celled; *stigma* sub-sessile, discoid or umbonate; *ovules* 2, collateral, pendulous, funicle thick. *Drupe* oblong, more or less compressed, surrounded at the base by the persistent calyx and corolla; *epicarp* coriaceous; *endocarp* woody, lined with a thin white membrane. *Seed* (according to Baillon) pendulous, exalbuminous; *cotyledons* fleshy, wrapping round the short superior radicle.—Distrib. Species 3 or 4, all tropical Asiatic.

Sarcostigma Wallichii, H. Brongn. in Adansonia, X, 282. A powerful climber; young branches pale, puberulous at first, afterwards glabrous like all the other parts except the inflorescence and fruit. *Leaves* coriaceous, shining, much reticulate, oblong to broadly ovate, acute, the base narrowed, under surface sometimes sparsely pubescent; main nerves 5 to 7 pairs, much curved, ascending; length 4 to 7 in., breadth 1·5 to 4·5 in., petiole ·4 to ·6 in. *Spikes of male flowers* axillary or extra-axillary, solitary or in fascicles, often nearly as long as the leaves, softly rufous-tomentose; *flowers* ·1 to ·15 in. long, sessile. *Calyx* a membranous, obscurely-toothed cup, rufous pubescent outside, glabrous inside. *Petals* about four times as long as the calyx, lanceolate, spreading, slightly united at the base, the apices inflexed, pubescent outside, gla-

brous inside. *Stamens* shorter than the petals, filaments glabrous. *Rudimentary ovary* ovoid, obtuse, pubescent. *Disk* none. *Female flowers* not seen. *Drupes* ovoid or globular-ovoid, compressed, 1·25 in. long and ·75 in. in diam.; *pericarp* leathery, densely rusty-tomentose; *mesocarp* pulpy, rather copious; *endocarp* thinly bony, smooth on both surfaces. Baillon in DC. Prod. XVII, 16; Hook. fil. Fl. Br. Ind. I, 594; *S. edule*, Kurz, For. Flora Burmah I, 242. *Chailletia edulis*, Wall. Cat. 9030 ("indetermin.") Kurz in Andaman Report, App. 6.

S. Andaman; Kurz, King's Collector.—DISTRIB. Burmah.

Kurz himself (in Herb. Calcut.) reduced his species *S. edule* to S. Wallichii Baill., and there is no doubt the reduction is right.

19. IODES, Blume.

Climbing shrubs, rarely erect. *Leaves* opposite, or sub-alternate, petiolate, simple, penni-nerved. *Inflorescence* cymose, cymes axillary or extra-axillary; lower peduncles often sterile, cirrose. *Flowers* dichlamydeous, dicœcious. MALE fl.: *Calyx* minute, cup-shaped, 5-toothed. *Corolla* 5-merous, lobes valvate. *Stamens* hypogynous, equal in number to, and alternate with the lobes of the corolla; *anthers* basifixed, straight, 2-celled, introrse, dehiscing longitudinally. *Pistil* rudimentary. FEMALE fl.: *Calyx* as in the male. *Corolla* 5-parted, the segments united below. *Staminodes* 0. *Ovary* sub-sessile, 1-celled, with 2 collateral pendulous ovules; *stigma* sessile, discoid. *Drupe* surrounded at the base by the persistent, but not accrescent calyx; *stone* 1-seeded. *Seed* pendulous, testa thin, albumen fleshy; *cotyledons* flat, leafy; *radicle* superior.—DISTRIB. Species about 8, natives of India, the Malayan Archipelago and tropical Africa.

Flowers 4-merous ... ... 1. *I. reticulata.*
Flowers 5-merous.
Calyx cupular with 5 minute teeth ... 2. *I. velutina.*
Calyx deeply divided into 5 lanceolate lobes.
Leaves ovate to rotund, pubescence rufous ... ... 3. *I. ovalis.*
Leaves oblong or oblong-lanceolate; pubescence cinereous ... ... 4. *I. oblonga.*

1. IODES RETICULATA, King, n. sp. A woody creeper 20 or 30 feet long; young branches slender, striate, with a broad line of tomentum on one side, changing sides at the nodes. *Leaves* thinly coriaceous, elliptic or broadly ovate, sometimes slightly obovate, shortly acuminate, narrowed slightly to the rounded or sub-emarginate base; both surfaces minutely but boldly reticulate, the upper glabrous, the lower with long soft hairs especially on the midrib and nerves; main nerves 4 or 5 pairs,

curving, ascending, prominent beneath as are the transverse nervules; length 2 to 5 in., breadth 1·3 to 2·5 in., petiole ·4 to ·6 in. *Cymes* both of male and female flowers terminal and extra-axillary, or occasionally axillary, usually much longer than the leaves, much-branched, and sometimes bearing tendrils, softly olivaceous-pubescent; pedicels longer than the flowers. *Male flowers* less than ·05 in. long, 4-merous, globular in bud. *Calyx* shorter than the corolla, with 4 acute segments, densely pilose outside. *Corolla* with 4 broadly ovate concave lobes, pilose outside and glabrous inside. *Stamens* shorter than the corolla, *anthers* broadly ovate, *rudimentary ovary* minute. *Female flowers* like the males but larger and with the lobes of the corolla reflexed. *Ovary* cylindric, tomentose, crowned by the broad discoid stigma, 1-celled, with 2 pendulous collateral ovules. *Drupe* elliptic, compressed, the apex with a slight apiculus bearing the stigma, the base narrowed; the calyx and corolla persistent but not enlarged, minutely velvetty; *endocarp* bony, 4-angled, smooth inside. *Seed* solitary.

Perak; Wray, King's Collector.

The tetramerous very small flowers, and large velvetty fruit, distinguish this species. The young branches are sub-glabrous on one side and densely pubescent on the other; at the nodes these two lines cross.

2. Iodes velutina, King, n. sp. A scandent shrub; young branches slender, terete, shortly rufous-pubescent, especially so on one side. *Leaves* coriaceous, ovate, acute or very shortly acuminate; the base rounded, slightly emarginate; upper surface sparsely and minutely pilose, the midrib tomentose; lower surface densely velvetty-tomentose; main nerves about 4 pairs, ascending, curved; length 2·5 to 3·75 in., breadth 1·35 to 2·25 in., petiole ·35 to ·6 in. *Cymes* axillary, terminal or leaf-opposed, longer than the leaves, pubescent, few-flowered, sometimes bearing tendrils. *Male flowers* ·1 in. long, or slightly more, globose-ovoid in bud, on very short pedicels. *Calyx* cupular, with 5 small acute teeth. *Corolla* little more than twice as long as the calyx, with 5 deep oblong concave teeth with inflexed apices, adpressed-pilose externally and glabrous internally like the calyx. *Stamens* nearly as long as the corolla; the filaments short, pilose, the anthers oblong. *Rudimentary ovary* ellipsoid, pilose. *Drupes* elongated-obovoid, compressed, 4-angled, obtuse or retuse at the apex, the stigma persistent, much narrowed to the base where the corolla and calyx are persistent, minutely cinereous-tomentose, 1·25 in. long, and ·5 in. broad; *endocarp* bony, more or less 8-angled, smooth inside. *Seed* solitary, compressed.

Malacca; Maingay (Kew Distrib.), No. 380, and perhaps No. 1039. Perak; Scortechini, Wray.

The leaves of this resemble those of *I. ovalis*, Bl.; but they are more velvetty beneath. The calyx and fruit are much larger than in that species and the cymes have fewer flowers.

3. Iodes ovalis, Blume Bijdr. 30. A climbing shrub 20 to 60 feet long; young branches slender, rufous-tomentose, striate, with a few axillary or leaf-opposed tendrils. *Leaves* opposite, sub-coriaceous, ovate to rotund, acute or very shortly acuminate, the base rounded sometimes slightly emarginate; upper surface glaberulous, the midrib and nerves rufous-tomentose like the whole of the lower surface; main nerves 4 or 5 pairs, curved, ascending, prominent on the lower surface as are the transverse veins; length 2·5 to 5·5 in., breadth 1·75 to 3·25 in. *Male flowers* in leaf-opposed or terminal, much-branched, lax, rufous-tomentose cymes 6 to 8 in. long. *Flowers* ·15 in. in diam., on pubescent pedicels ·1 to ·2 in. long. *Calyx* discoid, irregularly 3- to 6-toothed rufous-villose. *Corolla* 5 or 6 times as long as the calyx, deeply divided into 5 lanceolate lobes with long acuminate inflexed points, strigose externally, glabrous internally; *stamens* much shorter than the corolla-lobes, the filaments much shorter than the broadly ovate anthers; *rudimentary pistil* erect, cylindric, pilose. *Female flowers* with calyx and corolla like the male; *stamens* 0. *Ovary* cylindric, tomentose, crowned by a large discoid stigma wider than itself, 1-celled, with 2 pendulous ovules. *Drupe* ovoid, compressed, slightly oblique at the base, rufous-tomentose, crowned by the persistent stigma, ·75 in. long, and ·5 in. in diam., *pericarp* thin; *endocarp* bony, rugose outside, smooth inside. Mast. in Hook. fil. Fl. Br. Ind. I, 596; Beccari Malesia, I, 124; Baill. in DC. Prod. XVII, 22; *I. tomentella* cumvar. Br. in Benn. Pl. Jav. Rar. 243, t. 48; Hassk. Cat. Pl. Hort. Bogor. 172; Miq. Fl. Ind. Bat. i. 795. *I. tomentella*, Miq. Fl. Ind. Bat. I, Pt. 1, 796; Kurz For. Flora Burmah I, 243. *Natsatium oppositifolium*, Planch. in Hook. Lond. Journ. Bot. V, 247.

Malacca; Griffith, Maingay. Perak; Scortechini, Curtis, King's Collector; common.—Distrib.—Burmah, Sumatra.

4. Iodes oblonga, Planch. in Hook. fil. Fl. Br. Ind. I, 597. A slender climbing shrub; young branches cinereous-tomentose, ultimately glabrescent and rugose. *Leaves* membranous, oblong or oblong-lanceolate, glabrous above except the pilose midrib and nerves, beneath adpressed-pilose, the midrib pubescent; main nerves 7 or 8 pairs, curving, spreading; length 3 to 4·5 in., breadth 1 to 1·6 in., petiole ·3 or ·4 in. *Cymes of male flowers* axillary or terminal, dichotomously branched, slender, cinereous-pilose. *Male flowers* ·05 in. long. *Calyx* nearly as long as the corolla, with 5 deep lanceolate lobes. *Corolla* rufous-tomentose externally. *Female flowers* and drupes not seen,

Penang; Phillips, Curtis, No. 2438. Singapore; King's Collector, No. 1185.

This species has smaller flowers, with a longer calyx, than the last: its leaves are narrower, and its pubescence is cinereous not rufescent.

20. Erythropalum, Blume.

Climbing glabrous shrubs with axillary tendrils. *Leaves* alternate, entire, 3- to 5-nerved at the base. *Cymes* slender, pedunculate, dichotomous; the cymules umbellate, minutely bracteolate. *Flowers* bisexual. *Calyx* with 5 broad short teeth, imbricate in æstivation, its tube adherent and much enlarged in fruit. *Corolla* perigynous; *petals* 5, short, broad, spreading, slightly coherent by their bases, inserted outside the large cupular fleshy 5-lobed disc, valvate in æstivation. *Stamens* as many as the petals, opposite to them and slightly attached to their bases, *filaments* short; *anthers* broadly ovate with lateral longitudinal dehiscence, the connective rather large. *Ovary* half immersed in the disc, tapering to a short terminal style, 1-celled; *ovules* 1 to 3, pendulous from the apex; *stigma* minute, 3-lobed. *Fruit* crowned by the persistent calyx-lobes and the disc, oblong, 1-celled; the pericarp and putamen thin, lined by a pulpy coat, splitting, when dry, into 3 to 5 vertical segments. *Seed* solitary, pendulous; the embryo minute, lying near the apex of the large fleshy albumen.

To this genus there are attributed in the Flora of British India three species, *viz.*, *E. scandens*, Bl. *E. populifolium*, and *E. vagum*, Mast. Each of the three originally appeared in Botanical literature as the type of a distinct genus. Of these three genera, *Erythropalum* is the oldest and is therefore now retained. It was founded by Blume (Bijdr. 921) in 1826, and was by him referred to the Natural order *Cucurbitaceæ*. As Blume describes the flowers as monœcious, his material was presumably imperfect. For the reception of the second species, Dr. Walker-Arnott, in Jardine's Magazine of Zool. and Bot. for 1838, p. 551, formed the genus *Mackaya*, and in an excellent note he discusses its affinities. Of it he says, "I cannot indicate the natural order, nor even the place in the linear series which it ought to occupy;" but on the whole he was inclined to regard it as a species of *Olacineæ* near *Schœpfia*, but with perfectly inferior fruit. Walker-Arnott considered it to be also allied to *Santalaceæ*, although differing both from that Order and from *Olacineæ* in the absence of a central columella in its ovary; while, from *Santalaceæ*, it has the additional difference of possessing a corolla. And he suggests the formation of *Mackaya* and *Schœpfia* into a small calycifloral order connected on the one hand with *Santalaceæ* and on the other with *Olacineæ*. The third species *E. vagum* Mast., was first published by Griffith (Notulæ IV, 633 and Ic. Pl. Ind. Or. t. 628) as the type of a genus which, from its supposed affinity with *Modecca*, be named *Modeccopsis*. The relation to *Modecca* is however superficial, and extends only to a similarity in general habit and in the externals of the fruit. For in structure the flowers of *Modecca* are very different from those of *Modeccopsis*, inasmuch as they have no perigynous (finally epigynous) disc, and the superior ovary

has 3 parietal multi-ovulate placentas, while the fruit is a 3-valved many-seeded capsule. Planchon [Ann. des Sc. Nat. Ser. IV. Bot., Vol. II, p. 260 (1854,)] suggests the formation of a natural order for the reception of the single species *Erythropalum*, a suggestion followed by Miquel; while Baillon puts it (along with *Olacineæ Santalaceæ*, *Ampelideæ*, *Styraceæ*, and *Loranthex* proper) into his order *Loranthacées*. Messrs. Hooker and Bentham put *Erythropalum* into *Olacineæ*, where, in spite of its affinities with the Cornaceous genus *Nyssa*, it may be left for the present, although its inferior fruit makes its inclusion in *Olacineæ* rather an anomaly. To this genus also without doubt belong *Decastrophia*, Griffith (Notulæ IV, 737); *Erythropalla*, Hassk. Cat. Hort. Bogor, 191; and in all probability (as Valenton suggests) the obscure plant named *Balingayum decumbens* by Blanco (Fl. de Filip. 187.)

1. Erythropalum scandens, Blume Bijdr. 921. *Leaves* membranous, ovate-oblong or elliptic to oblong-lanceolate, acuminate, the base rounded or minutely cordate, sub-peltate; basal nerves 3 to 5, two of them minute; lateral nerves about 4 pairs, distant, faint: length 3 to 6 in., breadth 1·75 to 3·75 in., petiole ·75 to 1·75 in. *Tendrils* (abortive peduncles) simple or bifid, thickened upwards. *Cymes* slender, shorter than the leaves, divaricate, the peduncles long. *Flowers* under ·1 in. in diam. *Fruit* oblong, ellipsoid or slightly obovoid, glabrous, the epicarp yellowish. *Seed* large, ovoid, without testa. Miq. Fl. Ind. Bat. I, Pt, 1, 704; Hook. fil. Fl. Br. Ind. I, 578; Pierre For. Flor. Coch. Chine, t. 269 A; Kurz For. Flora Burma, I, 234; Valeton Olacineæ 132; Wall. Cat. 7539 Menisperma?; also No. 9033 (without name). *Cocculus calophyllus*, Wall. MSS.

Malacca, Perak:—Distrib. Java, Burmah, Tropical Himalaya, Khasia Hills.

Closely allied to, if not identical with, this is *E. vagum*, Mast. And *E. populifolium* Mast. (Wall. Cat. Nos. 1233 bis. and 2248; *Passiflora Heyneana*, Wall.)

21. Pteleocarpa, Oliv.

Trees. *Leaves* alternate, simple, penni-nerved, petiolate. *Inflorescence* terminal, panicled, many-flowered. *Flowers* regular, dichlamydeous, hermaphrodite. *Calyx* tubular below, limb deeply 5-parted, lobes imbricate, not accrescent. *Corolla* tubular below-limb deeply 5-parted, lobes imbricate, glabrous. *Stamens* 5, glabrous, attached to the tube of the corolla, alternate with its lobes; *anthers* linear-oblong, innate, dehiscing longitudinally. *Ovary* free, stipitate, 2-celled; *styles* 2, *stigmas* small; *ovules* solitary in each cell, pendulous, anatropal, raphe lateral or subventral. *Fruit* 2-celled, samaroid, orbicular, emarginate; the wings broad, thin, striate. *Seed* elongate, much compressed, albuminous; *radicle* superior, cylindrical; cotyledons linear-lanceolate, longer than the radicle.—Distrib. Species 2, both Malayan.

Pteleocarpa malaccensis, Oliver in Trans. Linn. Soc. XXVIII, 515, t. 42. A tree; young branches terete, glabrous, slender; all parts except the puberulous inflorescence glabrous. *Leaves* membranous, oblanceolate or oblanceolate-oblong, shortly and bluntly acuminate, the base much narrowed; midrib prominent beneath, the 5 or 6 pairs of curving spreading main nerves obscure on both surfaces; length 3 to 4·5 in., breadth 1·25 to 1·5 in., petiole ·6 to ·75 in. *Panicles* terminal, umbellately cymose, spreading, many-flowered, 1·5 to 2·5 in. in diam.; bracts minute, deciduous. *Pedicels* ·15 to ·25 in. long, filiform, ascending, lengthening in fruit. *Flowers* yellow, (or red ?) ·3 in., in diam. *Calyx-lobes* broadly ovate, obtuse, puberulous. *Corolla* four times as long as the calyx, its tube short, the lobes deep, oblong, obtuse. *Stamens* as long as the corolla; the filaments slender, glabrous, the anthers elliptic. *Ovary* on a short thick stalk, oblong, glabrous, compressed, slightly furrowed, obtuse. *Fruit* 1·25 to 1·65 in. long, the calyx persistent at the base not quite so broad. *Seed* ·5 in. long: embryo much shorter than the albumen. Beccari, Malesia, I, 130; Miq. Fl. Ind. Bat. Suppl. 511.

Malacca; Maingay. Penang; Curtis, Nos. 835 and 1494. Perak; Wray, No. 3418. Singapore; Hullett, Nos. 3609 and 3610.

I have seen an authentic specimen of *Dodoneea Lamponga*, Miq. (Fl. Ind. Bat. Suppl. 511) and there can be no doubt that it belongs to this or to a closely allied species. It was collected by Teysmann in Eastern Sumatra. Beccari has described (Malesia, I, 130) a species (*P. longistyla*) from Borneo, which appears to differ from *P. malaccensis* by the length of its styles and the shortness of the filaments of its stamens.

22. Cardiopteris, Wall.

Herbaceous, scandent, glabrous, the juice milky. *Leaves* alternate, long-petiolate, simple, palminerved. *Flowers* small, hermaphrodite regular, in axillary long sparse few-branched panicles. *Calyx* 5-partite, the lobes imbricate, persistent in the fruit, but very slightly accrescent. *Corolla* very deciduous, sub-campanulate, deeply 5-lobed, imbricate. *Stamens* attached to the short tube of the corolla and alternate with its lobes; filaments short, glabrous; anthers 2-celled, introrse, with vertical dehiscence. *Disk* none. *Pistil* free, cylindrical, slightly compressed, 1-celled: crowned by two stigmas, the one stipitate short and capitate, the other elongating after flowering. *Ovules* 2 (1 usually aborted), pendulous from the apex of the ovary. *Fruit* samaroid, obovate, oblong, emarginate at the apex; the nucleus narrow, elongate, prolonged laterally into membranous, horizontally striate wings and crowned by the columnar accrescent stigma. *Seed* solitary, pendulous, linear, sulcate, with thin testa,

fleshy granular albumen, and small conical embryo.—DISTRIB. A single Malayan species.

CARDIOPTERIS LOBATA, Wall. Cat. 8033 A, and in Benn. Pl. Jav. Rar. 246, t. 49. *Stems* twining, terete, striate, pale when dry. *Leaves* membranous, ovate-cordate, acuminate, more or less lobed, glabrous; main nerves 7 to 9, radiating from the apex of the petiole; length 2·25 to 5 in., breadth 1·5 to 2·75 in., petiole 2 to 5 in. long. *Panicles* 2 to 4 in. long, solitary, axillary, on long peduncles with a few long slender recurved few-flowered branches. *Flowers* distant, ·1 in. long, on short puberulous pedicels. *Calyx* puberulous; corolla slightly longer than the calyx, pale. *Anthers* emarginate. *Fruit* ·8 to 1·25 in. long, by ·6 to ·8 in. broad, the calyx persistent and very slightly accrescent. *Seed* sub-cylindric, compressed: Miq. Fl. Ind. Bat. I, Pt. 1, 799. H. Brongn. in Adansonia, X, 280: Baillon in DC. Prod. XVII, 26. *C. moluccana*, Blume, Rumphia, IV, 207. t. 177, f. 2. *C. javanica*, Blume l. c. III, 206, IV, t. 177. *Peripterygium quinquelobum*, Hassk. Cat. Pl. Hort. Bogor. 351. *Olus sanguinis*, Rumph. Herb. Amb. V, t. 482.

Perak: King's Collector.—DISTRIB. British India, Siam, Malayan Archipelago, New Guinea.

A widely distributed plant, varying considerably as to the form of its leaves. On these diversities of shape, four varieties have been founded.

The position of *Cardiopteris* has given rise to considerable discussion. Robert Brown was the first to suggest its affinity to *Phytocrene* and *Iodes*. By Wallich (its original founder) the genus was placed in *Sapindaceæ*; Hasskarl placed it in *Euphorbiaceæ*; and Blume regarded it as forming a separate family near *Boragineæ* and *Verbenaceæ*. There is no doubt that the gamopetalous character of the corolla and the absence of a disk are characters at variance with those of the majority of the species which are grouped in the family of *Olacineæ*; but the ovulation and structure of the fruit of *Cardiopteris* are quite unlike those of either of the gamopetalous families suggested as allies by Blume. The single character which, in my opinion, suggests a relationship with *Euphorbiaceæ* is the milky nature of the juice. The stamens and ovary, as Brown pointed out, are essentially those of *Iodes*, from which genus however this differs in calyx and in fruit. The genus with which, as it appears to me, there is by far the closest relationship is *Pteleocarpa*, Oliver. In fact the only characters which separate *Pteleocarpa* from *Cardiopteris* are that *Pteleocarpa* is a tree, while *Cardiopteris* is a scandent milky-juiced herb; and that *Pteleocarpa* has a 2-celled ovary and 2-celled fruit. And even this latter distinction is to a great extent neutralised by

the facts that, although there are two cells in the ovary of *Pteleocarpa*, there is only 1 ovule in each; and that both genera have two stigmas which are to some extent persistent in the fruit. The fruits of the two are strikingly alike, both being samaroid; and in this respect differing from all the other Asiatic genera which it has ever been proposed to include in *Olacineæ*. So great are the affinities of the two genera with each other, and so great their divergence from the other genera in the order, that I think they ought either to be separated as a tribe of *Olacineæ* or that the Natural family *Cardiopterideæ* first suggested by Blume, partially approved of by R. Brown, and adopted by Baillon, should be kept up, and that *Pteleocarpa* should be added to it.

Order XXX.—Ilicineæ.

Shrubs or trees. *Leaves* alternate, simple, exstipulate, or with 2 minute stipules, usually coriaceous and evergreen. *Flowers* small, in axillary cymes fascicles or umbellules, usually dicœcious; ♂ with imperfect ovary, and ♀ with imperfect stamens. *Calyx* 3–6-partite or -lobed; segments or lobes imbricate, persistent. *Petals* 4–5, rarely 6–8, connate at the base, or connate in the ♂ and free in the ♀, deciduous, imbricate. *Stamens* 4–5, adhering to the bases of the petals, sometimes free and hypogynous in the ♀: *filaments* subulate; *anthers* shortly oblong, dorsifixed. *Disk* 0. *Ovary* free, 3–16-celled; *style* 0, or very short, rarely long, stigma capitate or discoid; *ovules* 1, or 2 collateral, pendulous, raphe dorsal, micropyle superior, funicle often cupular. *Drupe* with 2 or more 1-seeded, free, rarely connate stones. *Seed* with a membranous testa, fleshy albumen and minute embryo.—Distrib. Three genera, and about 220 species, chiefly tropical.

1. Ilex, Linn.

Calyx 4–5-lobed or -parted. *Corolla* with petals free or connate at the base and rotate. *Stamens* 4–5, adhering to the base of the corolla in the ♂, sometimes hypogynous in the ♀. *Ovary* 2–12-celled; *styles* 0 or very short, stigmas free or confluent on the top of the ovary. *Drupe* globose, very rarely ovoid, with 2–16 stones.—Distrib. Of the Order; species about 220.

Flowers of both sexes in simple axillary racemes ... ... 1. *I. spicata.*

Flowers in axillary fascicles.

Pyrenes 6 or 7

Leaves very obtuse, entire ... ... 2. *I. epiphytica.*

Pyrenes 4

Leaves acute, serrulate ... ... 3. *I. Griffithii.*

Leaves shortly acuminate, entire ... 4. *I. glomerata.*
Flowers of both sexes in branched pedunculate cymes.
Pyrenes 4 to 6; nerves of leaves 10 to 12 pairs ... ... 5. *I. Maingayi.*
Pyrenes 8
Cymes dense, capituliform; nerves of leaves 7 or 8 pairs ... ... 6. *I. macrophylla.*
Cymes branched, often paniculate, rather lax; nerves of leaves 6 to 8 pairs ... 7. *I. cymosa.*
Imperfectly known ... ... 8. *I. sclerophylla.*

1. Ilex spicata, Bl. Bijdr. 1149. A glabrous shrub (sometimes epiphytal, *fide* Blume); young branches rather stout, pale, glabrous. *Leaves* coriaceous, elliptic, shortly and abruptly caudate-acuminate, the base rounded or slightly cuneate; the midrib stout, prominent beneath, depressed above; main nerves 7 to 12 pairs, faint, spreading (not much more prominent than the secondary) straight, interarching within the edge; length 3·5 to 6 in., breadth 1·5 to 2 in., petiole ·2 in. *Racemes* solitary or in pairs, axillary, ·75 to 1·5 in. long, sub-erect or spreading, puberulous, the bracts minute, pedicels ·1 in. long. *Flowers* shorter than the pedicels. *Calyx* rather flat, with 4 or 5 broad rounded lobes. *Petals* broadly oblong, united at the base, finally reflexed. *Stamens* as many as the petals, inserted at their edges near the base; *filaments* longer than the corolla, *anthers* small. *Female flowers* like the male, but the petals and stamens smaller. *Ovary* broadly ovoid, compressed, 16-celled; the stigma large, sessile, elongate. *Drupe* ·15 in. long, broadly ovoid, compressed, the stigma persistent; *pyrenes* 10 to 16, compressed. Hook. fil. Fl. Br. Ind. I, 598. *Prinos spicata*, Miq. Fl. Ind. Bat., I, Pt. 2, 594.

Malacca: Maingay (Kew Distrib.), No. 390. Perak: King's Collector, No. 2463.—Distrib. Java, (?) Borneo, Sumatra.

A species readily distinguished by its compressed fruit which has moreover many pyrenes (from 10 to 16).

2. *Ilex epiphytica*, King, n. sp. A small glabrous epiphytic shrub; young branches rather stout, pale brown, striate. *Leaves* coriaceous, oval or elliptic, sometimes sub-obovate, very obtuse, the edges entire recurved when dry, the base slightly narrowed; main nerves 5 or 6 pairs, rather straight, spreading, not prominent; length 2 to 2·75 in., breadth 1 to 1·35 in., petiole ·15 in., stout. *Female flowers* in axillary fascicles of 5 to 7, ·15 in. in diam., their pedicels ·15 in. long. *Calyx* with 5 to 7 broadly ovate concave obtuse imbricate teeth, puberulous at the edges. *Petals* 6, oblong, sub-obtuse, longer than the calyx, free, nearly equal, imbricate. Ovary broadly ovoid, tapering to the very short style,

6- or 7-celled; *stigma* discoid, dotted in the middle. *Drupe* ovoid, ·2 to ·25 in. long, crowned by the persistent style and stigma; *pyrenes* 6 or 7, trigonous. *Male flowers* not known.

Perak; at elevations of about 5,000 feet, Wray, No. 3811; King's Collector, No 7413.

3. Ilex Griffithii, Hook. fil. Fl. Br. Ind. I, 601. A bush or small tree; young branches stout, pubescent or glabrescent. *Leaves* coriaceous, elliptic, rarely elliptic-rotund, acute, the edges serrulate, the base slightly narrowed; upper surface glabrous, except the depressed puberulous midrib; lower surface puberulous or glabrescent, the midrib prominent and pubescent; main nerves about 8 pairs, spreading, interarching far from the edge; length 1 to 2·5 in., breadth ·5 to 1·3 in., petiole ·15 to ·25 in. *Flowers* 4-merous; the males fascicled, less than ·2 in. in diam., on pedicels longer than themselves. *Female flowers* larger than the males, in smaller fascicles, and sometimes solitary. *Calyx* a shallow cup, with 4 broad shallow ciliolate lobes. *Petals* broadly oblong, obtuse, finally re-curved, connate near the base. *Ovary* globose; *stigma* sessile, 4-lobed. *Drupe* globose or ovoid-globose, glabrous or glabrescent, ·15 in. in diam., the pulp scanty; *pyrenes* 4, coriaceous, rounded at the back; *pedicel* ·35 to ·6 in. long.

Malacca: Griffith, Maingay. Perak: Wray, King's Collector.—Distrib.: Sumatra, Java, Khasia Hills and Cachar, Assam.

4. Ilex glomerata, King, n. sp. A glabrous shrub or small tree; young branches, slender, dark-coloured. *Leaves* thinly coriaceous, oblong or elliptic-oblong, acuminate, the edges entire slightly wavy and recurved when dry, the base cuneate; main nerves 6 or 7 pairs, curving, ascending, forking, obsolete on the upper, faint on the lower surface; length 3 to 4·5 in., breadth 1·3 to 1·75 in., petiole ·3 to ·4 in. *Male flowers* ·2 in. in diam., in axillary fascicles of 6 to 12, their pedicels ·15 in. long. *Calyx* minute, with 4 shallow rounded teeth. *Petals* 4, very much longer than the calyx, broadly ovate, membranous, slightly coherent by their bases, hypogynous. *Stamens* alternate with and longer than the petals, slightly adherent to them at the base; *filaments* subulate, much longer than the broad shortly ovoid suturally dehiscent anthers; *Rudimentary ovary* ovoid, compressed, *stigma* sessile. *Female flowers* not known. *Drupes* globular, ·3 or ·35 in. in diam., the pulp copious; *pyrenes* 4, trigonous.

Perak: King's Collector, Curtis, No. 2091, Scortechini.

5. Ilex Maingayi, Hook. fil. Fl. Br. Ind. I, 605. A glabrous tree 20 to 30 feet high (60 to 80 *fide* Kunstler); young branches stout, lenticellate, dark-coloured. *Leaves* coriaceous, elliptic, narrowly elliptic-oblong or oblanceolate-oblong, sub-acuminate, the base narrowed; upper

surface shining, the lower dull and sub-glaucous; main nerves 10 or 12 pairs, sub-horizontal, faint on the lower, obsolete on the upper surface; length 4 to 5·5 in., breadth 1·35 to 2 in., petiole ·4 to ·65 in. *Male flowers* in pedicelled sub-umbellulate sub-racemose cymes about 1·25 in. long; the buds globular, less than ·1 in. in diam. *Calyx lobes* 4 in the male, 6 in the female, rounded, not ciliate. *Petals in the male* 4, broadly oblong; *stamens* longer than the petals and attached to their bases. *Female flowers* in short racemes; *petals* and *stamens* 6, hypogynous. *Ripe drupes* ovoid or globular, ·2 to ·25 in. in diam., grooved when dry; *pedicels* stout, as long as the drupes, pulp scanty; *pyrenes* 4 to 6, trigonous, thickly coriaceous; *stigma* sessile, swollen.

Penang, Maingay; (Kew Distrib.), No. 1021; Curtis, No. 2152. Perak; Scortechini, King's Collector.

6. Ilex macrophylla, Wall. Cat. 4331. A tree 15 to 30 feet high; young branches stout, pale, sometimes lenticellate. *Leaves* coriaceous, elliptic to elliptic-oblong, obtuse or sub-acute, entire, the base slightly narrowed; upper surface shining with the midrib depressed and the nerves obsolete; the lower dull, the 12 pairs of spreading nerves slightly prominent and interarching freely at some distance from the edge; length 4 to 6 in., breadth 2 to 2·5 in., petiole about ·5 in. *Cymes* dense, capituliform, often branching; their pedicels slender, axillary, longer than the petioles. *Flowers* ·15 in. in diam., 4–6-merous. *Calyx* with broad deep teeth. *Petals* broadly oblong, obtuse in the male flowers, united at the base; in the females, free and sub-equal. *Stamens* longer than the corolla and inserted on it. *Drupes* sub-globular, ·2 in. in diam., the *stigma* permanent and prominent; *pyrenes* about 8, trigonous.

Penang: Phillips, Wallich, Curtis, King's Collector. Malacca: Griffith, Maingay. Singapore: Ridley.

7. Ilex cymosa, Blume Bijdr. 1149. A glabrous tree 15 to 40 feet high; young branches slender, very pale. *Leaves* thinly coriaceous, elliptic-oblong to elliptic, the apex often shortly and bluntly acuminate, the base slightly narrowed or rounded, lower surface slightly glaucous; main nerves about 6 to 8 pairs, curved, ascending: length 2·5 to 4·5 in., breadth 1·35 to 2·5 in., petiole ·25 to ·35 in. *Cymes* solitary, pedunculate, branched and often paniculate, spreading, many-flowered, rather lax. *Flowers* ·1 in. in diam.; their pedicels slender, ·25 in. long. *Male flowers* 4–5-merous; the calyx lobes broad, rounded, ciliolate; *petals* broadly obtuse, about as long as the stamens. *Female flowers* with 5–6-merous calyx, and 6 to 8 short erect free concave slightly unequal petals; *ovary* globular-pyramidal; *style* short, thick; *stigma* large, hemispheric. *Drupes* globular, ovoid, crowned by the persistent style and stigma,

grooved when dry; the pulp scanty; *pyrenes* about 8, trigonous. Hook. fil. Fl. Br. Ind. I, 605. *I. singaporiana*, Wall. Cat. 6526. *Primos cymosa*, *Hassk.* Tijdsher. Nat. Gesch. X, 140: Miq. Fl. Ind. Bat. I, pt. 2, 595 *Leucodermis javanica*, Planch. MSS.

In all the provinces except the Andaman and Nicobar Islands: common.—DISTRIB.—Sumatra, Java, Borneo, and probably in other islands of the Malayan Archipelago.

The short thick style is in the ovary often obscured by the stigma, but in the ripe fruit it is very apparent.

8. ILEX SCLEROPHYLLA, Hook. fil. Fl. Br. Ind. I, 606. *Leaves* thickly coriaceous, elliptic-oblong, obtuse, the edges entire, narrowed at the base into the very thick petiole; upper surface shining, the lower glaucous; length ·5 or 6 in., petiole ·5 in. *Female cymes* 1 in. long, sparingly branched, the peduncle very stout, the branches apparently 3-flowered; the pedicels stout, ·25 in. long. *Calyx* with 5 rounded ciliolate lobes. *Petals* minute, free, unequal. *Ovary* ovoid, truncate, *stigma* sessile.

Malacca, on Mount Ophir: Griffith, No. 5013.

I have seen no specimens of this except Griffith's which is at Kew and the above description is largely copied from Sir Joseph Hooker.

Materials for a Flora of the Malayan Peninsula.—By GEORGE KING, M.B., LL.D., F.R.S., C.I.E., *Superintendent of the Royal Botanic Garden, Calcutta.* Journ. As. Soc. Bengal 65 (2): 625

No. 8.

[Recd. 18th May, Read 3rd June.]

ORDER XXXI. CELASTRINEÆ.

Erect or climbing trees or shrubs. *Branches* sometimes spinescent. *Leaves* opposite or alternate, more or less coriaceous, simple, petioled, rarely subsessile, entire or serrate; stipules caducous or 0. *Flowers* hermaphrodite or polygamous, usually cymose. *Calyx* small, with 4 or 5 imbricate lobes, persistent. *Petals* 4–5, rarely 0, inserted below the disc or continuous with its margin, imbricate. *Stamens* 3–5, rarely 2, filaments subulate or flattened, anthers 2-celled. *Disc* usually conspicuous, pulvinate or flattened, lobed or entire, rarely 0. *Ovary* sessile, the disc free at the base or confluent with it, 3–5 celled; style short or 0; stigma triangular, rarely 3-partite. Ovules 2 or 4 in each cell, anatropous, erect, rarely 1 and pendulous; or many, ascending and attached to the axis. *Fruit* capsular, baccate, drupaceous or samaroid. *Seed* arillate or exarillate, sometimes winged, albumen fleshy or 0; embryo usually large; cotyledons foliaceous, flat.—DISTRIB. Species about 500, scattered over the tropical and temperate regions of the whole world.

Tribe 1. CELASTRINEÆ, *Stamens* 4 or 5; the filaments slender, often recurved, inserted on or beneath the margin of the disc. *Seeds* (except in *Kokoona*) albuminous.

Fruit dehiscent, leaves opposite (sometimes alternate in *Lophopetalum*).

Ovules 2 in the axis of each cell, petals efoveolate.

Petals connate, seeds not arillate ... ... 1. MICROTROPIS.

Petals free, seeds arillate ... ... 2. EUONYMUS.

Ovules 1 in each cell, pendulous; petals bifoveolate, seeds arillate ... ... 3. GLYPTOPETALUM.

Ovules 4 or more in each cell; seeds winged.

Petals inappendiculate; disc cupular, the stamens inserted on its edge or on the inner vertical surface of its upturned edge; ovary not buried in the disc 4. KOKOONA.

Petals lamellate or crested on the upper surface; disc broadly orbicular, flat, the stamens inserted half way between the centre and circumference; ovary buried in the disc ... ... 5. LOPHOPETALUM.

Fruit dehiscent; leaves alternate; ovules 2 in each cell, erect; seeds arillate.

Disc free from the ovary, the stamens inserted on its margin, capsule 3-celled ... ... 6. CELASTRUS.

Disc confluent with the ovary, stamens inserted underneath it, capsule 3-celled ... ... 7. GYMNOSPORIA.

Ovary free from the disc. and crowned by a tuft of hairs; styles 2, capsule entire or 2-lobed ... ... 8. KURRIMIA.

Fruit a dry or pulpy indehiscent drupe ... ... 9. ELAEODENDRON.

Tribe II. HIPPOCRATEÆ. *Stamens* 3, rarely 2, 4 or 5; the filaments broad, flattened, recurved so that the anthers dehisce outwardly, inserted on the disc; seeds exalbuminous; leaves usually opposite.

Fruit flattened, dehiscent, seeds winged ... ... 10. HIPPOCRATEA.

Fruit globular or ovoid, pulpy and indehiscent, seeds not winged ... ... 11. SALACIA.

1. MICROTROPIS, Wall.

Glabrous trees or shrubs. *Leaves* opposite, petioled or subsessile, exstipulate, entire. *Flowers* in sessile clusters or in peduncled cymes, axillary or supra-axillary, sometimes unisexual. *Sepals* 4 or 5, imbricate. *Petals* 4 or 5, rarely 0, connate at the base, erect. *Stamens* 5, inserted on the disc or on the tube of the corolla. *Disc* 0, or small. *Ovary* free, ovoid, perfectly or imperfectly 2–3-celled; style very short or absent; stigma minutely 2–4-lobed; ovules 2 in each cell, collateral at the inner angle. *Capsule* ovoid, coriaceous, 1-celled, 2-valved, 1-seeded, surrounded at the base by the persistent calyx. *Seed* erect, stipitate; aril 0.—DISTRIB. Species about 12; mountains of India, Ceylon, the Malayan Peninsula and Java.

Cymes sessile, very condensed, about as long as the petioles, axillary, under ·5 in. long ... ... 1. *M. elliptica.*

Cymes and their peduncles ·5 to ·75 in. long, extra-axillary ... 2. *M. discolor.*

Cymes extra-axillary, on long thin peduncles.

Cymes 3- to 5-flowered, their peduncles ·5 to ·75 in. long; petals ovate-rotund ... ... 3. *M. bivalvis.*

Cymes many-flowered, their peduncles 1·25 to 3 in. long; petals oblong ... ... 4. *M. filiformis.*

1. MICROTROPIS ELLIPTICA, n. sp. King. A shrub or small tree; young branches terete, pale when dry. *Leaves* thinly coriaceous, broadly

elliptic, rather suddenly and sharply acuminate, the base more or less cuneate; lower surface pale brown when dry, the upper olivaceous; main nerves about 6 pairs, curved, ascending, faint; length 4·5 to 5 in., breadth 1·85 to 2·5 in., petiole ·3 in. *Cymes* axillary, condensed, sessile, not much longer than the petioles, 6- to 8-flowered. *Flowers* ·25 in. in diam., sessile. *Sepals* 4 or 5, narrowly reniform, with dark coarse teeth. *Petals* 4 or 5, larger than the sepals, sub-rotund, fleshy, with sub-entire membranous edges. *Stamens* 4 or 5, slightly shorter than the ovary, much shorter than the petals; anther-cells divaricate at the base; the filaments flattened, broad and united into a tube in their lower half. *Ovary* 2-celled, produced into the long cylindro-conic glabrous style; stigma capitate, faintly 2-lobed. *Fruit* glabrous, ovoid, tapering to apex and base, the style and calyx persistent, length ·6 to ·7 in., its peduncle ·2 in.

Malacca: Maingay (Kew Distrib.), No. 945/2. Penang: Curtis Nos. 345, 968. Perak: King's Collector, Nos. 1333, 1582, 4193.

2. Microtropis discolor, Wall. Cat. 4337. An erect shrub or small tree; young branches thin, terete, smooth, dark-coloured when dry. *Leaves* thinly coriaceous, oblong-lanceolate, much acuminate, entire, the base acute; both surfaces dull when dry, the lower pale: main nerves 4 or 5 pairs, curved, ascending, faint; length 3·5 to 4·5 in., breadth 1 to 1·75 in., petiole ·25 to ·3 in. *Cymes* ·5 to ·75 in. long or less, slightly extra-axillary, spreading, divaricate, 8- to 10-flowered, bracteolate. *Flowers* ·1 in. in length, subsessile. *Sepals* narrowly reniform, unequal, the edges minutely ciliolate. *Petals* much larger than the sepals, broadly oblong-ovate, rather concave, with a slight central ridge, glabrous. *Anthers* 5, ovoid, with short filaments inserted on a thin hypogynous disc. *Ovary* longer than the stamens, 2-celled, tapering into the thick conical style: stigma truncate, 2-lobed. *Fruit* sub-globular, glabrous, ·3 in. long. Kurz For. Flora Burma, I, 251; Lawson in Hook. fil. Fl. Br. Ind., I, 614; Arn. in Ann. Nat. Hist. iii, 152. *Cassine discolor*, Wall. in Roxb. Fl. Ind., ed. Carey, ii. 378. *Celastrinea*? Wall. Cat. 9014. *Euonymus garcinifolius*, Roxb. Fl. Ind. i. 628.

Penang, in damp ravines on West Hill, elevat. 2,000 feet, Curtis No. 1727; also on Government Hill.—Distrib. Sub-tropical Himalaya, Khasia Hills, Burma.

A species very common along the base of the Himalaya and the Khasia Hills and in Burma; but found in these provinces only in Penang. Mr. Curtis's specimens differ from those from British India in having rather smaller flowers and fruit, and much shorter filaments; otherwise they agree perfectly.

3. Microtropis bivalvis, Wall. Cat. 4340. A bush or small tree;

young branches terete, dark-coloured when dry. *Leaves* thinly coriaceous, oblong-lanceolate, acuminate, entire, the base narrowed; both surfaces pale and rather dull when dry : main nerves 5 or 6 pairs, faint, not more prominent than the intermediates : length 2·5 to 3·5 in., breadth 1 to 1·75 in., petiole ·25 to ·35 in. *Cymes* extra-axillary, from 1 to 1·5 in long; the peduncle filiform, ·5 to ·75 in. long. *Flowers* about 3 to 5, ·25 in. in diam., on thin divaricating pedicels ·2 to ·3 in. long (longer in fruit). *Sepals* narrowly reniform, imbricate in two rows, sub-glabrous, pale, the edges dark-coloured and minutely crenulate. *Petals* larger than the sepals, spreading, rather coriaceous, ovate-rotund, narrowed to the base, glabrous. *Stamens* 5; the anthers broadly ovate, the filaments dilated and conjoined in their lower half into a tube. *Disc* none. *Ovary* short, 2-celled; style about as long as the stamens, cylindric, striate, expanded at the apex, the stigma truncate and 2-lobed. *Fruit* ovoid, glabrous, crowned by the persistent style and with the calyx persistent at the base, ·5 in. long, usually 1-celled and 1-seeded, but sometimes 2-celled and 2-seeded. Lawson in Hook. fil. Fl. Br. Ind. I, 614 (in part).

Penang: Wallich's Collector; Curtis, No. 1025. Malacca: Maingay (Kew Distrub.) No. 392/2.

The plant here described is that issued by Wallich doubtfully as a *Microtropis* under the name *M? bivalvis*. It is not, as Wallich apparently supposed, the plant published by Jack in 1820 (Malayan Miscellanies No. V) as *Celastrus? bivalvis*; for Jack describes his plant as apetalous. I have seen no authentic specimen of Jack's plant; but I have little doubt that it is, as Miquel believed, the same as the species to receive which that Botanist founded in 1859 the genus *Paracelastrus* (Miq. Flor. Ind. Bat. I, pt. 2, p. 590). Wallich issued under his Catalogue number 7270, and the name *Euonymus capillaceus*, a Penang plant with solitary capillary extra-axillary pedicels; but his specimens have neither flowers nor fruit. It is possible that this may be the lost *Celastrus? bivalvis* of Jack. The issue of Wallich's Catalogue was not begun until 1828, eight years later than the issue of the number of the Malayan Miscellanies where Jack's *C. ? bivalvis* was published. But, as Wallich correctly suggested the genus *Microtropis* for his No. 4340, that author's name must stand for this plant, and another must be found for the true apetalous *Celastrus? bivalvis* of Jack, should Miquel's genus *Paracelastrus* not be maintained.

4. Microtropis filiformis, King. A small tree, 10 to 15 feet high; young branches slender, terete, dark-coloured when dry. *Leaves* thinly coriaceous, more or less broadly elliptic, shortly acuminate, the edges sub-undulate, slightly recurved when dry, the base cuneate; the upper surface shining, the lower dull, pale; main nerves 5 to 8 pairs,

spreading, indistinct, not more prominent than the intermediate and secondary ; length 4·5 to 7 in., breadth 1·5 to 2·75 in., petioles ·3 to ·4 in. *Cymes* axillary or extra-axillary, on filiform peduncles 1·25 to 3 in. long, divaricate, bracteolate, 1–many-flowered. *Flowers* ·3 in. in diam., on pedicels ·1 to ·2 in. long. *Sepals* narrowly reniform, sparsely-puberulous. *Petals* much longer than the sepals, oblong, obtuse, with a central longitudinal ridge on the upper surface, puberulous, united into a short tube at the very base. *Stamens* 5, longer than the pistil but much shorter than the petals; *anthers* broadly ovoid, the filaments dilated especially at the base and attached to the corolla-tube. *Ovary* short, disc none ; *style* cylindric, ridged ; *stigma* broad, flat. *Fruit* ovoid, pointed glabrous, smooth ; ·5 in. long, the calyx persistent at its base, the style subpersistent on the apex. *M. bivalvis*, Lawson in Hook. fil. Fl. Br. Ind. I, 614 (in part) *not of Wall. Microtropis bivalvis*, Kurz (not of Wall). For Flora Burma, I, 251. *Euonymus? laeta*, Wall. Cat. No. 4294. *Euonymus filiformis* No. 4295.

Penang : Porter, Stolickza. Perak : Wray No. 435, King's Collector, No. 2025. Distrib. Tenasserim, Helfer, No. 1980 (Kew Distrib.)

This has been included by Mr. Lawson in Fl. Br. Ind. under *M. bivalvis*, Wall., but it is a perfectly distinct plant ; differing from that in the great length of the peduncles of its cymes, in the larger size of its leaves, and in its fewer larger flowers.

2. Euonymus, Linn.

Trees or shrubs, erect, rarely scandent, glabrous. *Leaves* opposite, petioled, rarely subsessile ; stipules caducous. *Calyx* 4–5-fid, spreading or curved. *Petals* 4–5, free, efoveolate. *Stamens* 4–5, inserted on the disc ; anthers broad, 2-celled. *Disc* large, fleshy, 4–5-lobed. *Ovary* sunk in the disc, 3-5-celled ; style short or 0, stigma 3–5-lobed ; ovules 2 in each cell, attached to the inner angle, ascending and suspended. *Capsule* 3–5-celled, 3–5-lobed, angled or winged, coriaceous, rarely echinate ; cells 1–2-seeded, loculicidal. *Seeds* covered by the aril, albuminous.—Distrib. About 80 species chiefly tropical Asiatic and Malayan ; a few European and North American.

Flowers usually in fascicles of 2 or 3, rarely in 2- to 3-flowered cymes ; petals fimbriate ... ... 1. *E. Javanicus.*
Flowers in very lax divaricate slender spreading 10-to 20-flowered cymes ; petals not fimbriate ... 2. *E. Wrayi.*

1. Euonymus Javanicus, Blume Bijdr. 1146. A shrub or small tree ; young branches slender, sub-terete. *Leaves* sub-coriaceous, ob-

long-lanceolate or elliptic-oblong, acuminate, remotely and obscurely serrate, or entire, the base cuneate ; main nerves 5 or 6 pairs, impressed on the upper surface when dry ; length 4 to 6 in., breadth 1·35 to 2·5 in., petioles ·3 to ·5 in. *Flowers* in fascicles of 2 or 3 from the axils of leaves or of fallen leaves, sometimes from a common peduncle 1 to 2 in. long: peduncles slender, ·5 in. long, (much longer in fruit). *Sepals* 5, small, rotund. *Petals* 5, broadly oblong, much larger than the sepals, fimbriate. *Stamens* 5, the anther cells divaricate, the connective thick. *Ovary* conical. *Fruit* obovate or pyriform, deeply 5-lobed, ·75 in. long. Benn. in Horsf. Pl. Jav. Rar. 13, t. 28 ; Hassk. in Nat. Tijdschr. Gesch. x. 149 ; Miq. Fl. Ind. Bat. I, pt. 2, p. 588 ; Hook fil. Fl. Br. Ind. I, 607 ; Kurz For. Flora Burma, I, 249. *E. sumatranus*, Miq. Fl. Ind. Bat. Suppl. 512. *E. sphaerocarpus*, Hassk. Cat. Hort. Bogor. 229. *E. timorensis*, Zipp. ex Spanoghe in Linnæa XV, (1841) 186.

In all the Provinces except the Andaman and Nicobar Islands. Distrib. Burma, the Malayan Archipelago.

A widely distributed species, varying very little. The form distinguished as *E. sumatranus* by Miquel has rather longer fruit than usual, and its leaves are more distinctly serrate.

2. Euonymus Wrayi, n. sp. King. A small tree ; young branches terete, smooth, dark-coloured when dry. *Leaves* as in *E. javanicus*, but the main nerves less prominent. *Cymes* axillary or terminal, long-pedunculate, very lax, 3 to 4 in. across ; the branches filiform, divaricate, 12- to 20-flowered, bracteolate at the base ; the peduncles slender, 1·5 to 2 in. long. *Flowers* nearly ·25 in. in diam. on slender minutely bracteolate pedicels ·25 to ·35 in long. *Sepals* 5, large, rotund, spreading, concave, glabrescent, the edges membranous. *Petals* 5, not much larger than the sepals, rotund, clawed ; the edges incurved, undulate but not fimbriate, minutely puberulous, green with dull crimson veins. *Anthers* 5, short, with globular cells opening upwards, the connective orbicular. *Disc* thick, fleshy, obtusely 5-lobed. *Ovary* sunk in the disc, broad with a conical apex ; stigma capitate, small. *Fruit* shortly and broadly pyriform, deeply 5-lobed, the calyx persistent at its much contracted base, ·75 in. long and nearly as broad at the apex.

Perak : on Gunong Batu Pateh, elevat. 4,500 feet ; Wray No. 403 Pahang : Kota Glanggi, Ridley No. 2652.

3. Glyptopetalum, Thwaites.

Erect shrubs or small trees, glabrous. *Leaves* opposite, petioled, ex-stipulate. *Cymes* 3-or more-flowered. *Calyx* with 4 short spreading lobes. *Petals* 4, each with 2 pit-like depressions on the upper surface. *Stamens* 4, inserted above the disc ; the connective dilated ; anther-cells

diverging. *Disc* 4-lobed. *Ovary* immersed in the disc, 4-lobed, 4-celled; style short, stigma capitate; ovules solitary and pendulous from the top of each cell. *Capsule* subglobose, coriaceous, 1–4-celled, 1–4-seeded. *Seeds* as in *Euonymus*.—DISTRIB. Species 7; in Ceylon, Southern India, and Malayan Peninsula.

Leaves 2·5 to 3·5 in. long ... ... 1. *G. Scortechinii.*
„ 6 to 12 in. long ... ... 2. *G. quadrangulare.*

1. GLYPTOPETALUM SCORTECHINII, n. sp. King. Young branches terete, striate. *Leaves* coriaceous, elliptic, often slightly obovate, very shortly and obtusely cuspidate, the edges with a few remote obscure serratures in the upper third, the base cuneate; main nerves 8 to 10 pairs, spreading, much curved, very faint and not more prominent than the intermediate and secondary nerves; length 2·5 to 3·5 in., breadth 1·35 to 1·75 in., petioles ·25 in. *Flowering peduncles* rather stout, supra-axillary, 1·5 to nearly 2 in. long; pedicels 2 or 3, under an inch in length. *Fruit* broadly obovate, deeply 5-lobed, glabrous, ·45 in. long, the 5 sub-rotund reflexed sepals persistent at its base.

Perak: Scortechini, No. 1617.

A species collected only by the late Rev. Father Scortechini, whose specimens are not in flower. He referred the plant to *Euonymus*, but the solitary ovules in the cells of the immature fruit show that its place is in *Glyptopetalum*.

2. GLYPTOPETALUM QUADRANGULARE, Prain MSS. in Herb. Calc. A shrub 8 to 15 feet high; young branches boldly 4-angled, narrowly winged. *Leaves* coriaceous, elliptic or elliptic-oblong, shortly acuminate, obscurely and remotely serrate in the upper half, the base rounded or cuneate; both surfaces bullate, the upper shining, the lower dull; main nerves 10 to 12 pairs, when dry much depressed on the upper and very prominent on the lower surface, the reticulations wide and distinct; length 6 to 12 in., breadth 2·5 to 5 in., petiole ·3 to ·6 in. *Cymes* much shorter than the leaves, dichotomous, minutely 2-bracteolate at the bifurcations, axillary, few-flowered, on slender peduncles 1·5 to 2 in. long (nearly twice as long in fruit). *Flowers* ·3 in. in diam., their pedicels 2·5 in. long (longer in fruit). *Sepals* 4, narrowly reniform, entire. *Petals* 4, attached to the edges of the thick fleshy 4-lobed disc, much longer than the sepals, broadly rotund-reniform, clawed, the edges incurved, smooth. *Anthers* reniform; the cells on short thin filaments, sub-orbicular. *Ovary* sunk in the disc, the capitate stigma alone projecting, 4-celled: ovules solitary. *Fruit* depressed, obtusely 4-angled, capsular, ·4 to ·6 in. in diam.

Perak: Scortechini No. 524. Wary No. 3229: King's Collector Nos. 7106, 8222.

4. Kokoona, Thwaites.

Trees with opposite petioled coriaceous leaves. *Calyx* small, 5-lobed. *Petals* 5, free, coriaceous, without crests. *Stamens* 5, inserted on the margin of the disc; anthers oblong. *Disc* thick, glandular, sub-entire. *Ovary* immersed in the disc, 3-celled; style short, stigma 3-lobed; ovules 4 in each cell, in 2 series, adnate to the axis, ascending. *Capsule* woody, oblong, 3-gonous, 3-celled, 3-valved; cells 4-seeded. *Seeds* broadly winged above, imbricate, exalbuminous.—Distrib. Species 5; Ceylon, Malayan Peninsula and Borneo.

The only tangible distinctions between this genus and *Lophopetalum* appear to be that (1) in this there are no appendages of any kind on the petals, whereas in *Lophopetalum* they are lamellate or crested (or both) on the anterior surface; (2) the disc in this is cupular and the stamens are inserted either on its edge or on the inner vertical surface of its up-turned edge; (3) the ovary is not buried in the disc, whereas in *Lophopetalum* the disc is broadly orbicular and flat and the stamens are inserted (often in pits) half way between its centre and circumference, the ovary being buried in the disc. The seeds, which used to be relied upon for distinctive marks, are found, now that the ripe fruit of *Lophopetalum* is better known, to be winged in both, and the fruit in both to be an elongated triquetrous or 3-winged capsule. It seems doubtful whether this genus should be maintained as distinct from *Lophopetalum*.

Panicles much longer than the leaves, 4 to 6 in. long; flowers ·1 in. in diam. ... 1. *K. littoralis.*
Panicles shorter or only a little longer than the leaves; flowers ·25 or ·3 in. in diam.
Leaves elliptic or elliptic-oblong, 2·75 to 3·5 in. long ... ... 2. *K. Scortechinii.*
Leaves broadly ovate to ovate-oblong, 4·5 to 5 in. long ... ... 3. *K. coriacea.*

1. Kokoona littoralis, Laws. in Hook. fil. Fl. Br. Ind. I, 617. A tree; leaves thinly coriaceous, broadly ovate, acute or sub-cuspidate, entire, subundulate, the base rounded; main nerves 8 to 10 pairs, spreading, faint; length 3 to 4 in., breadth 2 to 2·5 in., petiole ·8 to 1 in. *Panicles* axillary or terminal, large, 4 to 6 in. long and about as much across, many-flowered, bracteolate, the branches divergent, the branchlets cymose. *Flowers* ·1 in. in diam., the pedicels about as long. *Calyx* lobes sub-acute. *Petals* not crested or fimbriate; filaments inserted on the edge of the disc. *Disc* orbicular and without appendages. *Fruit* capsular, broadly 3-winged, 4·5 in. long and 1·5 in. broad, the pericarp coriaceous; *Seeds* 1·5 to 2 in. long, oblong, compressed, winged all round. *Lophopetalum littoralis*, Kurz For. Flora Burma, I, 255. *Trigonocarpus littoralis*, Wall. Cat. No. 6520.

Malacca: Maingay. Singapore; Lobb.—Distrib. Burma.

2. KOKOONA SCORTECHINII, King n. sp. A large tree 70 to 80 feet high; young branches smooth, dark-coloured when dry. *Leaves* coriaceous, elliptic or elliptic-oblong, acute or sub-acute, entire, the base cuneate, lower surface cinereous when dry; main nerves about 6 or 7 pairs, spreading, faint; length 2·75 to 3·15 in., breadth 1·35 to 2 in., petioles ·25 to ·35 in. *Panicles* axillary, peduncled, pyramidal, sometimes longer than the leaves; the branches divaricate, the ultimate branchlets racemose. *Flowers* not crowded, about ·25 in., in diam., on bracteolate pedicels about as long as themselves. *Calyx* cupular, fleshy, glabrous, with 5 (rarely 4) shallow broad teeth. *Petals* 5, (rarely 4), inserted below the disc, longer than the calyx, fleshy, broadly ovate, with a slight vertical central ridge on the anterior surface. *Disc* fleshy, shortly cylindric, with 10 shallow quadrate teeth. *Stamens* 5; the filaments fleshy below, slender above, inserted on the inner surface of the disc. *Anthers* large, ovate, sub-cordate at the base, the apex with a short stout incurved appendage. *Ovary* conical, short, thick, free from the disc, 3-celled. *Stigma* sessile, large, capitate-cylindric. *Fruit* unknown.

Perak: Scortechini, No. 2042. Penang, Curtis, No. 1576.

This has been gathered in Penang by Mr. Curtis, who describes it as a tree about 40 feet high. The late Father Scortechini, who gathered it once in Perak, and who referred it doubtfully to *Lophopetalum reflexum* Laws., describes it as a tree 70 to 80 feet high. Its fruit is still unknown.

3. KOKOONA CORIACEA, King n. sp. A tree 30 to 50 feet high; young branches cinereous when dry. *Leaves* coriaceous, broadly ovate to ovate-oblong, sub-acute, the base cuneate, the edge when dry slightly recurved; upper surface dark when dry, the lower cinereous; main nerves 6 or 7 pairs, curved, erecto-patent, rather faint on both surfaces; length 4·5 to 5 in., breadth 2 to 3 in., petiole ·5 to ·6 in. *Panicles* axillary, pedunculate, from half as long to as long as the leaves; the branches divaricate, racemose, few-flowered. *Flowers* ·3 in. in diam., on bracteolate pedicels shorter than themselves. *Calyx* cupular, thick, with 5 short shallow broad teeth. *Petals* 5, attached outside the short disc, longer than the calyx, thick, broadly ovate, with a vertical ridge in the middle. *Stamens* 5; the filaments subulate, inserted on the inner vertical surface of the cupular fleshy obscurely 5-lobed corrugated disc; anthers large, cordate, with a long apical appendage. *Ovary* ovoid, glabrous, inserted in the fundus of the flower and separate from the disc, 3-celled: *stigma* sessile, cylindric-capitate. *Fruit* unknown.

Perak: King's Collector, No. 4226.

5. Lophopetalum, Wight.

Trees or shrubs, usually glabrous. *Leaves* opposite or alternate, petioled, exstipulate. *Sepals* 5, rounded, short, spreading. *Petals* 5, continuous with the disc, persistent, the upper surface cristate or lamellate, or covered with fleshy villi, or naked. *Stamens* 5, inserted on the disc far from its edge; *anthers* oblong. *Disc* large, flat, entire or lobed. *Ovary* small, immersed in the disc and continuous with it, trigonal or pyramidal, 3–4-celled, contracted into a short style, stigma capitate; ovules 4 or more in each cell, in 2 series. *Capsule* coriaceous, 3–4-angled, 3–4-celled, loculicidal. *Seeds* winged, albumen fleshy.—Distrib. Species 15; Indian and Malayan.

Leaves very thickly coriaceous; flowers ·75 in. in diam., cymes longer than the leaves ... 1. *L. pachyphyllum.*
Leaves thinly coriaceous.
  Flowers ·5 in. in diam. ... ... 2. *L. fimbriatum.*
  Flowers ·25 to ·3 in. in diam.
    Leaves more or less obovate ... 3. *L. subobovatum.*
    Leaves not obovate.
      Disc without fleshy hair-like processes
        Sepals bluntly ovate ... ... 4. *L. Scortechinii.*
        Sepals deltoid-rotund ... ... 5. *L. oblongum.*
      Disc with numerous fleshy hair-like processes over its whole surface.
        Leaves 2·5 to 3 in. long; petals rotund-deltoid, the upper surface with numerous fleshy processes ... 6. *L. pallidum.*
        Leaves 4·5 to 6 in. long; petals ovate-elliptic, with a broad-based acuminate fleshy process on the upper surface ... ... 7. *L. oblongifolium.*
      Disc with fleshy processes only at the edges of the pits in which the filaments are inserted ... ... 8. *L. Curtisii.*
  Flowers only about ·1 in. in diam. ... 9. *L. reflexum.*

Imperfectly known species ... ... *E. fuscescens.*

1. Lophopetalum pachyphyllum, n. sp. King. A tree 80 to 100 feet high; young branches slender, terete, dark-coloured when dry. *Leaves* thickly coriaceous, elliptic-oblong, sub-acute, entire, the base narrowed; upper surface pale when dry; the lower cinereous, thickly

covered with very minute papillae ; main nerves 7 or 8 pairs, ascending, curved ; length 4 to 5·5 in., breadth 1·6 to 2·75 in., petiole ·5 to ·75 in. *Cymes* paniculate, axillary or terminal, bracteolate, 3 or 4 in. in diam., on peduncles 2 or 3 in. long. *Flowers* ·75 in. in diam. ; their pedicels slender, bracteolate, about ·5 in. long. *Calyx* and disc rotund, scarcely lobed. *Petals* attached to the edge of the disc, rotund with truncate bases, thick, not fimbriate. *Disc* fleshy, slightly convex, the slender filaments rising far from its edge ; anthers ovate. *Ovary* expanded below, 3-angled above, glabrous. Fruit unknown.

Malacca : Maingay (Kew Distrib.) No. 403. Perak : King's Collector No. 7325.

Fruit of this is unknown. The species is a very distinct one, at once recognisable by its large flowers and very thick leaves. The petals, according to Kunstler, are pale yellow with a dark patch at the base.

2. Lophopetalum fimbriatum, Wight Ill. I. 178. A small tree : young branches terete, dark-coloured when dry. *Leaves* thinly coriaceous, elliptic or elliptic-oblong, shortly cuspidate, entire, the base rounded or slightly narrowed ; upper surface olivaceous when dry, the lower brown ; main nerves 7 to 9 pairs, spreading, curving, slightly prominent beneath ; length 3 to 4·5 in., breadth 2 to 2·25 in., petiole ·65 in. *Cymes* axillary or terminal, pedunculed, paniculate ; the branches divaricate, many-flowered. *Flowers* ·5 in. in diam., on pedicels ·25 in. long. *Calyx-lobes* very short. *Petals* rotund-obovate, much larger than the sepals, with transverse fimbriate crests about the middle. *Stamens* with long slender filaments, inserted on the middle of the broad 5-lobed disc. *Ovary* depressed, tapering into the conical style. *Fruit* 3-angled (ripe unknown.) Laws. in Hook. fil. Fl. Br. Ind. I. 615 ; Kurz For. Flor. Burma, I. 255. *L. ovatum*, Presl. Botan. Bemerk. 32. *L. javanum*, Turcz. in Bull. Soc. Nat. Mosc. 1863, pt. i. 545. *Euonymus ovata*, Wall. Cat. 4300.

Malacca : Griffith.—Distrib. Burma, Chittagong, Sylhet.

3. Lophopetalum sub-obovatum, n. sp., King. A tree ; young branches cinereous when dry. *Leaves* obovate-oblong, obtuse, slightly cuspidate, entire, much narrowed to the base, the lower surface pale brown when dry ; main nerves about 6 pairs, spreading, faint ; length 2·5 to 4 in., breadth 1·4 to 2 in., petiole ·35 to ·45 in. *Panicles* axillary, pedunculate, 2 to 3·5 in. long, and 1 to 2·5 in. in diam., branching from near the base, the branches divaricating ; the branchlets cymose, few-flowered. *Flowers* ·3 in. in diam. *Calyx* spreading ; the teeth deltoid, sub-acute. *Petals* 5, larger than the calyx, broadly-oblong, sub-obtuse, corrugated on the upper two-thirds of the anterior surface and

crested. *Disc* thick, fleshy, entire, pitted. *Stamens* 5; the filaments subulate, their bases in small inappendiculate pits; *anthers* small, ovate. *Ovary* sunk in the disc, conical; *stigma* minute. *Fruit* unknown.

Penang: on Government Hill, Curtis, No. 1501.

4. Lophopetalum Scortechinii, n. sp. King. A tree 60 to 80 feet high: young branches slender, terete, dark-coloured when dry. *Leaves* coriaceous, broadly elliptic or ovate, sometimes obovate; the apex obtuse, sub-acute or very shortly cuspidate, the base narrowed; main nerves about 5 pairs, spreading or ascending, faint; length 3·5 to 4·5 in., breadth 1·75 to 2·25 in., petioles ·4 to ·5 in. *Panicles* cymose, axillary, shorter than the leaves, the flowers rather crowded towards the end of the short divaricating compressed branches. *Flowers* ·25 in. in diam. *Sepals* 5, bluntly ovate, spreading. *Petals* 5, deltoid-rotund, spreading, flat with undulate edges, attached to the edges of the broad thin 5-angled fleshy disc. *Anthers* 5, sub-sessile, ovate-orbicular; ovary much depressed, sunk in the disc with only the capitate stigma protruding, 4- or 5-celled. *Fruit* (mature not seen) elongate, glabrous, 3-winged, 3-celled, the calyx persistent at its base; seeds flat, winged at both ends. *Euonymus mammillaris*, Scortechini MSS.

Perak: Scortechini, No. 1941 King's Collector, No. 6676.

5. Lophopetalum oblongum, n. sp. King. A tree 50 feet high: young branches striate, dark-coloured when dry. *Leaves* coriaceous, oblong or elliptic-oblong, acute, entire, the base cuneate; main nerves 7 or 8 pairs, curved, spreading; length 3·5 to 4·5 in., breadth 1·5 to 1·8 in., petiole ·4 to ·5 in. *Panicles* axillary, rather shorter than the leaves, 2·5 to 3·5 in. in diam., the branches divaricate; the branchlets cymose, many-flowered. *Flowers* ·3 in. in diam.; their pedicels ·1 in length. *Sepals* 5, deltoid-rotund, thick, spreading. *Petals* 5, thinner and longer than the sepals, each with an elongate sub-fimbriate crest on the anterior surface. *Stamens* 5, inserted far from the edge of the thick fleshy slightly 5-angled disc: anthers ovate, filaments short. *Ovary* sunk in the disc, tapering into the rather thin style, *stigma* minute. *Fruit* woody, 3-winged, 5 in. long and nearly 1·5 in. broad. *Seeds* flat, 2·5 in. long (including the wings.)

Penang: near the waterfall, Curtis, No. 2736.

6. Lophopetalum pallidum, Laws. in Hook. fil. Fl. Br. Ind. I. 615. A glabrous tree; young shoots slender, dark-coloured when dry. *Leaves* thinly coriaceous, elliptic-oblong, sub-acute, entire, the base rounded, both surfaces pale when dry; main nerves 8 to 10 pairs, spreading, faint; length 2·5 to 3 in., breadth 1·1 to 1·3 in., petiole ·3 to ·4 in. *Cymes* ·5 to ·75 in. long, axillary, 6- to 8-flowered, the peduncle and branches 4-angled. *Flowers* ·25 in. in diam.; calyx and disc rotund, not lobed. *Petals* rotund-deltoid, fleshy, attached to the edge of the

disc, incurved, with a number of fleshy lobular processes on their upper surface. *Disc* fleshy, almost flat, with many thick fleshy hair-like processes shorter than the filaments. *Anthers* 5, ovate; the filaments longer than the anthers, inserted in pits on the disc. *Ovary* broadly conical. *Fruit* unknown.

Malacca: (Kew Distrib.) No. 393.

Known only by Maingay's scanty specimens, not one of which is in fruit.

7. Lophopetalum oblongifolium, King n. sp. A tree 80 to 100 feet high: young branches glabrous, terete, dark-coloured when dry. *Leaves* opposite, coriaceous, oblong or elliptic-oblong, shortly and rather bluntly acuminate, entire, the base cuneate, both surfaces glabrous; main nerves 8 or 9 pairs, spreading, slightly curved; length 4·5 to 6 in., breadth 1·75 to 2·25 in., petiole ·5 to ·65 in. *Panicles* axillary and terminal, about half as long as the leaves, minutely bracteolate, glabrous; the branches spreading, the ultimate branchlets cymose. *Flowers* ·25 in. in diam., their pedicels about as long as themselves. *Calyx* flat, corrugated externally, the edge with 5 broad sub-reniform short teeth closely applied to the corolla. *Petals* 5, continuous with the margin of the disc, much larger than the calyx-lobes, ovate-elliptic, the edges slightly laciniate or entire, the upper surface with a broad-based pointed fleshy appendage and some hairs. *Disc* flat, broad, obscurely 5-angled, covered with very short coarse bristle-like hairs. *Stamens* 5, inserted on the disc, filaments short: anthers ovate, 2-celled, longitudinally dehiscent. *Ovary* conical, sunk in the disc, 3-celled; *style* short, thick; stigma small. *Fruit* unknown. *Euonymus adenophorus*, Scort. MSS. in Herb. Calc.

Perak: Scortechini, No. 1943.

8. Lophopetalum Curtisii, n. sp. King. A medium-sized tree: young branches very slender, dark-coloured when dry. *Leaves* coriaceous, broadly ovate, cuspidate, entire, the base cuneate; upper surface when dry at first glaucous, afterwards dark-coloured, the lower always pale and very minutely dotted, both glabrous; main nerves about 6 pairs, curving, faint; length 2 to 2·5 in., breadth 1 to 1·5 in.; petiole ·5 or ·6 in., slender. *Cymes* axillary or terminal, about 1 to 1·35 in. long; the branches divaricating, 10- to 20-flowered. *Flowers* ·3 in. in diam., as in *L. pallidum*, but the hair-like processes on the disc confined to the edges of the pits in which the bases of the filaments are inserted.

Penang on Government Hill; Curtis, No. 1577.

A species with flowers like *L. pallidum*, but with leaves of thicker texture, broader, and with longer petioles. The cymes also are larger and the disc is devoid of processes, except round the edges of the pits from which the filaments spring.

9. Lophopetalum reflexum, Laws. in Hook. fil. Fl. Br. Ind. I. 616. A tree 40 to 50 feet high, young branches darkly cinereous when dry. *Leaves* coriaceous, ovate-lanceolate, acuminate, the edges undulate; the base slightly cuneate, rarely rounded; main nerves 4 or 5 pairs, very faint; length 2·25 to 3·25 in., breadth 1 to 1·2 in., petiole ·25 to ·3 in. *Panicles* longer than the leaves, pedunculate; the branches divaricate, cymose, many-flowered, bracteolate, sparsely and minutely rufous-pubescent. *Flowers* ·1 in. in diam., their pedicels twice as long or more. *Sepals* 5, thick, fleshy, rotund-deltoid, spreading. *Petals* 5, thinner and larger than the sepals, rotund-ovate, inserted on the edge of the orbicular entire fleshy disc. *Anthers* 5, almost sessile on the disc far from its edge, broadly ovate. *Ovary* broadly conical, sunk in the disc, 3-celled, tapering into the short style, *stigma* minute. *Fruit* unknown.

Malacca: Maingay (Kew Distrib.) No. 393/2. Penang: Curtis, No. 1502.

Imperfectly known species.

Lophopetalum fuscescens, Kurz in Journ. As. Soc. Beng. for 1875, pt. 2, p. 202. A glabrous tree. *Leaves* coriaceous, oblong, shortly acuminate, entire, rounded at the base, the lower surfaces of the leaves ferrugineous when dry: main nerves 16 or 18 pairs, prominent on the lower surface; length 4 to 8 in., breadth 2·5 to 3 in., petiole ·8 to 1·25 in. *Panicles* axillary and terminal, shorter than the leaves, pedunculate; the branches spreading, cymose, puberulous, minutely bracteolate. *Flowers* probably about ·2 in. in diam., their pedicels stout and longer than themselves. *Calyx*-lobes short, broad, rounded. *Petals* ovate, rather obtuse, coriaceous with broad membranous margins, induplicate in bud, glabrous, each with an elongated trigonous corrugated process on its upper surface. *Disc* indistinctly 5-lobed, rugulose when dry. *Stamens* 5, with rather long filaments. *Fruit* unknown.

Singapore; T Anderson.

The description of the flowers of this species is taken from Kurz (*l. c.*) The only specimens which I have seen are two collected by the late Dr. T. Anderson at Singapore and named by Kurz himself, and the flowers on these are too imperfect for examination. These specimens have quite the *facies* of a *Lophopetalum* allied to *L. oblongifolium*.

6. Celastrus, Linn.

Scandent shrubs. *Leaves* alternate, petioled; stipules minute and deciduous, or 0. *Flowers* polygamous or hermaphrodite, in terminal or axillary panicles or racemes. *Calyx* 5-cleft. *Petals* 5, spreading. *Disc*

broad, concave. *Stamens* 5, inserted on the margin of the disc. *Ovary* not immersed in the disc, 2–4-celled; *style* short; stigma 3-lobed, rarely 3-fid with the segments recurved; ovules 2 in each cell, erect. *Capsule* globose or obovoid, 1–3-celled, 1–6-seeded. *Seeds* enveloped in a fleshy aril, albumen fleshy; cotyledons foliaceous.—Distrib. Species about 20; natives of tropical Asia, China, Japan, Australia and North America.

Celastrus Championi, Benth. in Hook. Journ. Bot. for 1851, p. 334. A climber 40 to 50 feet long: branches slender, smooth, black when dry. *Leaves* coriaceous, elliptic, elliptic-oblong or ovate, acute or shortly acuminate, the base rounded or sub-cuneate, the edges minutely serrate or sub-entire, both surfaces glabrous; main nerves 5 or 6 pairs, slightly prominent on the lower surface; length 3·5 to 4·5 in., breadth 1·8 to 2·5 in., petiole ·5 in. *Racemes* several from one axil, usually shorter than the leaves. *Fruits* on pedicels as long as themselves, dehiscing, 3-valved: the dehisced valves broadly ovoid, black externally, pale within, about ·5 in. long, one-seeded. Benth. Flora Hongkongensis, 64. *Catha Benthami*, Gardn. and Champ. in Hook. Journ. Bot. for 1851, 310.

Perak: Wray Nos. 175, 1031, 1096: King's Collector No. 6928 and 6982; Scortechini No. 1428; Ridley No. 5237.

7. Gymnosporia, W. & A.

Shrubs or small trees, branches often spinescent. *Leaves* alternate, exstipulate. *Flowers* in small dichotomous cymes. *Calyx* 4–5-cleft. *Petals* 4–5, spreading. *Stamens* 4–5, inserted underneath the disc. *Disc* broad, sinuate or lobed. *Ovary* attached by a broad base, or immersed in the disc, 2–3-celled; style short, 2–3-lobed; ovules 2 in each cell. *Capsule* obovoid or nearly globose. *Seeds* 1–2 in each cell; aril completely or partially covering the seed, or 0, albumen fleshy; cotyledons foliaceous.—Distrib. Species 60; natives of the hotter parts of the whole world.

Gymnosporia Curtisii, King n. sp. A scandent shrub; young branches rather stout, cinereous, glabrous. *Leaves* coriaceous, ovate-elliptic, sub-acute, the edges with distant shallow crenations, the base rather suddenly narrowed to the petiole; both surfaces glabrous, the lower slightly paler when dry; main nerves about 10 to 15 pairs, often forking below the middle, faint; length 4 to 6 in., breadth 2·25 to 3 in., petiole ·4 to ·5 in. *Cymes* about ·5 to ·7 in. long, few-flowered, fasciculate, often collected at the apex of extra-axillary naked branches 1·5 to 2 in. long. *Flowers* ·15 in. in diam.; their pedicels two or three times as long, glabrous. *Sepals* 5, semi-orbicular, the edges with a few short thick cilia. *Petals* 5, oblong, obtuse, much longer than the sepals. *Stamens* 5, shorter than the petals, the filaments inserted below the

disc, flat, incurved; anthers small, sub-orbicular. *Disc* a wide fleshy cup with thick entire edge. *Ovary* ovoid, obscurely 3-angled, seated on and confluent with but not immersed in the disc, 3-celled. *Style* short, clavate. *Fruit* broadly ovoid, almost globular, 3-angled; the pericarp coriaceous, dark-coloured externally, 3-valved, the dehisced valves almost square. *Seeds* 1 or often 2 in each cell.

Kedah: Curtis No. 2500.

Known only by Curtis's specimens. Inasmuch as (1) the stamens are inserted below and not on the margin of the disc, (2) the ovary is inserted on and confluent at its base with the disc, and (3) the inflorescence is cymose and not racemose or paniculate, this is a *Gymnosporia* rather than a *Celastrus*. The scandent habit, however, is that of *Celastrus*. It appears to me a little doubtful whether these two genera ought to be kept distinct. The species of both are in want of careful revision.

8. Kurrimia, Wall.

Trees, usually glabrous, young branches tipped with the deciduous stipules. *Leaves* opposite, rarely alternate, towards the ends of the branches, coriaceous, entire, shining, penninerved, petiole slender. *Flowers* in panicles or racemes. *Calyx* 5-fid, spreading. *Petals* 5, inserted under the margin of the disc, spreading or recurved. *Stamens* 5, inserted with the petals. *Disc* fleshy, sub-entire or 5-lobed. *Ovary* free, glabrous or puberulous at the base, crowned at the top with a tuft of hairs; styles 2, filiform; stigmas small, capitate; ovules 2 in each cell, erect. *Capsule* entire or 2-lobed, 1–2-celled, dehiscing by 2 valves, 1–2-seeded. *Seeds* erect, completely or partially covered by a fleshy aril; albumen abundant, fleshy, cotyledons linear-oblong.—Distrib. India, Ceylon, Malayan Peninsula and Archipelago: species 3 or 4.

Flowers in racemes, glabrous, disc sub-entire, fruit not bifid ... ... 1. *K. pulcherrima.*
Flowers in panicles, puberulous, disc deeply 5-lobed, fruit bifid ... ... 2. *K. paniculata.*

1. Kurrimia pulcherrima, Wall. Cat. 4334. A tree 40 to 70 feet high; young branches glabrous. *Leaves* coriaceous, oblong or elliptic-oblong, acuminate, entire, the base rounded; both surfaces glabrous, the upper shining, the lower dull and pale when dry; main nerves about 12 pairs, curved, ascending, prominent on the lower surface; length 6 to 8 in., breadth 1·75 to 3·25 in., petiole ·8 to 1 in., narrow and spike-like. *Racemes* several from an axil, shorter than the leaves, glabrous. *Flowers* on pedicels shorter than themselves, ·15 in. in diam.

glabrous. *Sepals* 5, free, elliptic, obtuse. *Petals* 5, elliptic-rotund, obtuse, larger than the sepals. *Stamens* 5; *anthers* broadly ovate, cordate, filaments flattened. *Disc* cupular, glabrous or nearly so, the edges obscurely lobed. *Capsule* narrowly ellipsoid, *with 2 vertical grooves*, much tapered to the apex, glabrous 1 to 1·5 in. long, 1-celled, 1-seeded. *Seed* ·6 to ·8 in. long, ellipsoid, brown, shining. Lawson in Hook. fil. Fl. Br. Ind. I, 622. *K. Maingayi*, Laws. *l. c.* *K. robusta*, Kurz For. Flora Burma, I. 253. *K. calophylla*, Wall. Cat. 4335. *K. robusta*, Kurz MSS. *Rhesa Moja*, Ham. MSS. ex Arn. in Ed. Phil. Journ. xvi. 315; Walp. Rep. i. 538. *Celastrus robustus*, Roxb. Fl. Ind. i. 626. *Nothocnestis sumatrana*, Miq. Fl. Ind. Bat. Suppl. i. 531.

Malacca: Griffith, No. 1994 (Kew Distrib.). Singapore; Maingay, Kew Distrib. No. 394. Andamans, King's Collectors. Distrib. Burma, Chittagong, Khasia Hills, Assam and Sikhim, Sumatra.

I cannot discover any mark to separate *K. Maingayi*, Laws. from typical *K. pulcherrima*, Wall. and I have therefore reduced that species here. This is a much rarer tree in the Malayan Peninsula than the next which is very common.

2. Kurrimia paniculata, Wall. Cat. 4336. A tree 30 to 60 feet high; young shoots glabrous. *Leaves* coriaceous; leaves as in the last but often slightly narrowed to the base, and sometimes with as many as 24 pairs of nerves; petioles varying from 1 to 2·25 in. and occasionally even 3 in. in length. *Panicles* shorter than the leaves, the branches sparse and spike-like, puberulous. *Flowers* ·15 in. in diam., on pedicels about as long as themselves. *Sepals* 5, spreading, ovate, obtuse, puberulous. *Petals* 5, much larger than the sepals, broadly ovate, sub-acute, puberulous, especially on the inner surface. *Stamens* 5, rather shorter than the petals, inserted between the deep quadrate lobes of the disc; the filaments flattened, puberulous; the *anthers* short, broadly ovate. *Ovary* sub-rotund, pubescent towards the narrowed apex. *Fruit* ·65 in. long, more or less deeply bifid, each half 1- or sometimes 2-seeded; the pericarp leathery, nearly black externally and glabrous. *Seeds* oblong often plano-convex, with dark shiny testa, ·3 in. long. Lawson in Hook, fil. Fl. Br. Ind. I. 622. *Rhesa paniculata*, Arn in Ed. Phil. Journ. xvi. 315; Walp. Rep. i. 538. *Trochisandra indica*, Bedd. Fl. Sylv. t. 120; Fl. Sylv. Anal. Gen. lxvii. *Pyrospermum calophyllum*, Miq. Fl. Ind. Bat. Suppl. i. 402.

In all the provinces except the Nicobar and Andaman islands. A much commoner tree than the last. Distrib. Sumatra.

There is considerable variety in the length of the petiole in this species, but I cannot discover that differences in its length are associated with differences in any other organ.

9. Elæodendron, Jacq. f.

Small trees or shrubs. *Leaves* opposite or subopposite, crenate or entire. *Flowers* in axillary branching cymes, often polygamous. *Calyx* 4- or 5-cleft. *Petals* 4 or 5, spreading. *Disc* cupular. *Stamens* 4 or 5; anthers nearly globose. *Ovary* continuous with the disc, conical, rarely 2–4- or 5-celled, style very short, ovules 2 in each cell. *Fruit* succulent or dry, 1–2-celled, indehiscent; cells 1- rarely 2-seeded. *Seed* without an aril, albuminous.—Distrib. About 40 species, natives of South Africa, Tropical Asia, America and Australia.

Elæodendron sub-rotundum, King n. sp. A tree 20 feet high: young branches sub-compressed, glabrous, dark-coloured when dry. *Leaves* broadly ovate or sub-rotund, obtuse or sub-cuspidate, the edges entire and slightly revolute, the base slightly narrowed or rounded; both surfaces glabrous, dull, the upper pale, the lower brown when dry: main nerves 6 or 7 pairs, spreading obliquely, little curved: length 2 to 2·5 in., breadth 1·2 to 1·8 in.; petiole ·3 to ·5 in., slender. *Cymes* axillary and terminal, umbellate on a common peduncle, 1·5 to 2·5 in. long, 1 5 to 2 in. in diam., much-branched, many-flowered. *Flowers* numerous, nearly ·2 in. in diam., their pedicels longer than themselves. *Calyx* short, cupular, deeply divided into 4 or 5 rotund concave lobes. *Petals* 4 or 5, broadly oblong, blunt, spreading, glabrous, sparsely scaly outside. *Disc* short, cupular, thin, wavy, not lobed. *Stamens* 4 or 5, inserted on the outer surface of the disc; the filaments nearly as long as the pistil, slender; *anthers* ovate, basifixed. *Ovary* ovoid, tapering, surrounded at the base, but not confluent with, the thin disc, 2-celled; *style* short, *stigma* small. *Fruit* (immature) ·5 in. long, oblong-clavate, dark-coloured, glabrous, crowned by the persistent style, 1-celled (by abortion) and 1-seeded.

Perak: King's Collector No. 1166. Andamans; King's Collector. Johore; King. Pahang; Ridley No. 1001 *a*.

This differs from *E. glaucum*, Pers, in having smaller flowers which are always 5-merous; in having a smooth (not lobed or corrugated) disc; a much less tapering ovary; and entire leaves with fewer nerves.

10. Hippocratea, Linn.

Small trees or scandent shrubs. *Leaves* opposite, petioled; stipules small, caducous. *Flowers* small, white or greenish, disposed in axillary cymes, more rarely in terminal cymose panicles. *Calyx* small, 5-parted or of 5 free sepals. *Petals* 5, spreading much larger than the calyx, imbricate or valvate. *Stamens* 3, the filaments recurved and lying in the grooves of the ovary; anthers short, broad, often 1-celled and with transverse dehiscence. *Disc* flat or cupular. *Ovary* surrounded by the

disc, 3-celled ; style very short or 0, stigmas 1–3 ; ovules 2–10 in each cell, in 2 series, inserted on the inner angle. *Fruit* of 3 flattened carpels connate at the base, usually dehiscent. *Seeds* compressed, usually winged below, exalbuminous.—Distrib. Species about 90, natives of the tropics of both hemispheres.

Panicles and flowers ferrugineous-tomentose
Flowers ·2 in. long... ... ... 1. *H. ferruginea.*
Panicles and flowers glabrous, or at most puberulous, never ferrugineous.
Flowers ·3 in. or more in diam.
Petals glabrous on the upper surface ... 2. *H. macrantha.*
Petals densely glandular-villous on the upper surface ... ... 3. *H. Cumingii.*
Flowers ·15 in. in diam.
Leaves entire ; petals broadly oblong-obovate ... ... 4. *H. Andamanica.*
Leaves remotely and rather minutely serrate ; petals orbicular ... ... 5. *H. Nicobarica.*
Flowers ·05 in. in diam. ... ... 6. *H. indica.*
Doubtful species ... ... *H. Maingayi.*

1. Hippocratea ferruginea, King n. sp. A climber ; young shoots slender, glabrous, the older cinereous. *Leaves* coriaceous, elliptic-oblong, sub-acute or shortly cuspidate, entire, the base rounded or sub-cuneate ; both surfaces glabrous, shining, the reticulations rather distinct ; main nerves about 5 pairs, curved, ascending ; length 3·25 to 5·5 in., breadth 2 to 2·5 in., petiole ·3 to ·4 in. *Panicles* axillary, nearly as long as the leaves, with large divaricating ferrugineous-pubescent pyramidal branches. *Flowers* ·2 in. long, on pedicels rather shorter than themselves. *Sepals* 5, rotund, concave, densely rusty-tomentose outside, glabrous inside. *Petals* 5, several times longer than the sepals, oblong-obovate, with long slender claws, conduplicate, rusty-tomentose outside, glabrous inside, falcately curved so that the tips connive. *Disc* large, its lower edge thickened and wavy. *Stamens* 3, the filaments flattened, broad, reflexed ; the *anthers* sub-globular, 1-celled, with transverse dehiscence. *Ovary* inserted on the disc, sub-globular, deeply 3-lobed. *Style* cylindric, *stigma* minute. *Fruit* unknown.

Penang : Curtis, No. 175.

Known only by Mr. Curtis's specimens.

2. Hippocratea macrantha, Korth. Verh. Nat. Gesch. 187, t. 39. A climber ; young branches slender, minutely lenticellate, glabrous. *Leaves* coriaceous, elliptic, sometimes rotund-elliptic, rarely slightly obovate, shortly and obtusely cuspidate, the edges with shallow cre-

nations, the base cuneate or rounded, both surfaces glabrous; main nerves 5 or 6 pairs, spreading, curving, prominent on the lower surface; length 4 to 7 in., breadth 1·75 to 3·25 in., petiole ·2 to ·4 in. *Panicles* axillary, cymose, pedunculate, much shorter than the leaves, puberulous, minutely bracteolate. *Flowers* ·3 in. in diam., on thin pedicels longer than themselves. *Calyx* cupular, puberulous, with 5 broad shallow obtuse teeth. *Petals* 5, much longer than the calyx, lanceolate, puberulous on the lower, glabrous on the upper surface. *Disc* deep, fleshy, with a broad ring of minute hairs on its upper half, deeply scooped out on the upper surface to receive the small 3-celled ovary; the 3 stamens attached to the margin of the disc, their filaments flat and much recurved; *anthers* small rounded. *Carpels* usually 2, flat, oblong, obtuse, sometimes obovate-oblong and emarginate at the apex, striate, 2·5 to 4 in. long. *Seeds* 2 to 3 in. long, the wing large and thinly membranous. Miq. Fl. Ind. Bat. I, pt. 2, p. 599 : Kurz For. Flora Burma, I, 257. *H. lanceolata*, Ham. Wall. Cat. 4214. *H. grandiflora*, Wall. Cat. 4215. *H. obtusifolia*, Laws. (in part but not of Roxb.) in Hook. fil Fl. Br. Ind. I, 624.

South Andaman: King's Collector. Perak: King's Collector. Wray: common. Distrib. Burma, Chittagong, Assam, Sikhim, Terai.

Flowers of Chittagong and Assam specimens of this which I have dissected agree perfectly with Korthal's figure. Most of the specimens from the other localities cited are in fruit only; but their leaves agree so absolutely with the flowering specimens from Assam as to leave no doubt that they are conspecific. Helfer's No. 905 (Kew Distrib.), and perhaps Griffith's No. 911 from the Eastern Himalaya, belong to this. *H. Cumingii*, Laws. resembles this both in flowers and leaves; but the petals in that are glandular-hairy on the upper surface, while in this the upper surface of the petals is quite glabrous.

3. Hippocratea Cumingii, Laws. in Hook. fil. Fl. Br. Ind. I, 624. Scandent; young branches slender, brown when dry, glabrous. *Leaves* coriaceous, broadly elliptic, acute or shortly and obtusely cuspidate, the base rounded; both surfaces glabrous, the lower reticulate. *Panicles* axillary, shorter than the leaves, dichotomously cymose, few-flowered. *Flowers* ·45 in. in diam., their pedicels longer than themselves. *Calyx* cupular, covered with minute deciduous tomentum, the mouth with 5 shallow broad rather blunt lobes. *Petals* much longer than the calyx, linear-oblong, sub-acute, densely glandular-villous on the upper surface, minutely tomentose on the lower. *Disc* broad, with a belt of hairs about the middle. *Fruit* unknown.

Malacca: Griffith. Distrib.—Philippines.

An imperfectly known species.

4. HIPPOCRATEA ANDAMANICA, n. sp. King. A climber; young branches slender, glabrous, pale-brown when dry. *Leaves* thinly coriaceous, oblong to elliptic, sub-acute or shortly and obtusely cuspidate, entire, the base cuneate; both surfaces glabrous; main nerves 5 to 7 pairs, ascending, curved, slightly prominent beneath; length 4 to 5·5 in., breadth 1·8 to 2·75 in., petiole ·4 to ·6 in. *Panicles* often several together, axillary or terminal, as long as or slightly longer than the leaves, many-flowered, much-branched. *Flowers* ·15 in. in diam., on pedicels longer than themselves, buds globular. *Calyx* of 5 broad rotund spreading sepals, united at the base and irregularly dentate on the edges. *Petals* 5, larger than the sepals, broadly oblong-obovate, obtuse, glabrous, spreading. *Disc* broad, fleshy, hollowed out to accommodate the small 3-partite ovary. *Stamens* 3, inserted on the inverted edge of the disc; filaments short, broad, recurved; *anthers* broad, 1-celled by abortion, dehiscing transversely. *Style* short, *stigma* sub-capitate. *Fruit* unknown.

South Andaman Island; King's Collectors.

5. HIPPOCRATEA NICOBARICA, Kurz in Journ. As. Soc. Beng. for 1875, pt. 2, p. 203. Scandent; young branches slender, dark-coloured, with sparse minute pale warts. *Leaves* coriaceous, elliptic, shortly and obtusely cuspidate, remotely and rather minutely serrate, the base rounded; both surfaces glabrous, the upper shining, the lower dull and paler; main nerves 7 to 10 pairs, spreading, faint; length 4·25 to 6·5 in., breadth 2·25 to 3·25 in., petiole ·35 in. *Panicles* dichotomously cymose, axillary, shorter than the leaves, about 2 in. in diam., minutely bracteolate, many-flowered. *Flowers* nearly ·15 in. in diam. *Calyx* cupular, glabrous; the lobes short, broad, blunt. *Petals* larger than the calyx, orbicular, glabrous. *Disc* convex, its edge up-turned, glabrous, obscurely 5-angled, almost concealing the ovary. *Anthers* small, sub-sessile. *Fruit* unknown.

Nicobar Islands; Kurz.

6. HIPPOCRATEA INDICA, Willd. Sp. Pl. I. 193. A small glabrous shrub or tree usually with climbing branches; young branches slender, dark-coloured. *Leaves* thinly coriaceous, elliptic or elliptic-ovate, sub-acute or bluntly cuspidate, the edges finely serrate; the base more or less narrowed, rarely rounded; main nerves about 5 pairs, inconspicuous; length 2·5 to 3·5 in., breadth 1·4 to 1·8 in., petiole ·3 in. *Panicles* umbellately cymose, much-branched, peduncled, spreading, axillary or terminal, usually shorter than the leaves but sometimes much longer, 1 to 3 in. in diam. *Flowers* ·05 in. in diam. *Calyx-lobes* broadly triangular, the edges hairy. *Petals* longer than the calyx, sub-erect, oblong, obtuse, concave. *Anthers* small, sub-orbicular. *Ovary* broadly

ovoid, glabrous, 3-grooved; *stigma* sub-sessile, capitate. *Carpels* usually 2, oblong, blunt, flat, vertically striate, ½ in. long, each with two long winged seeds. DC. Prodr. i. 568; Roxb. Fl. Ind. i. 165; Cor. Pl. ii. t. 130; W. & A. Prodr. 104: Dalz. & Gibs. Bomb. Fl. 32; Thwaites Enum. 52; Oliv. Fl. Trop. Afr. i. 368; Brand. For. Fl. 83; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 599; Lawson in Hook. fil. Fl. Br. Ind. I. 624: Kurz For. Flora Burma. I. 256. *H. barbata*, Mull. Phil. Trans. Inst. Vict. III, 23. *H. disperma*, Vahl. Enum. II, 28: Wall. Cat. 4210 (in part). *H. euonymoides*, Vahl, Enum. II. 98. *H. obtusifolia*, Wall. (not of Roxb.) Cat. 4211 A and B. *H. tortuosa*, Wall. Cat. 4126 (in part). *Tonsella disperma*, Poir. *Celastrinea*? Wall. Cat. 9013.

Malacca: Griffith, Maingay (Kew Distrib.) No. 396. Singapore; Hullett. Distrib.—Sumatra Java, British India, Ceylon.

There has been considerable confusion about the Indian species of the genus *Hippocratea*. The confusion originated to some extent with Wallich who issued, under the same name *H. obtusifolia*, Roxb. and the number 4211, a plant which is really *H. indica*, Willd. In Mr. Lawson's account of *H. obtusifolia*, Roxb. in Hooker's Flora of British India (I. 623) the following six are reduced to that species, *viz.*, *H. barbata*, Mull.; *H. rigida*, Spanoghe; *Salacia laevigata*, Wight: *Hippocratia? grandiflora*, Wall Cat. 4213; *H. volubilis*, Heyne in Wall. Cat. 4215, and *H. tortuosa*, Wall. Cat. 4216. Besides Roxburgh's description of *H. obtusifolia*, in Fl. Ind. I. 166, there is his original coloured figure in the Calcutta Herbarium to guide us as to what plant the author really meant to describe under this name. Moreover, so recently as 1883, there have been collected by Mr. J. S. Gamble at Chengalapalam (in the Nellore district of the Madras Presidency) specimens (Herb. Gamb. No. 12216) of a plant which agree absolutely with Roxburgh's description and figure. These specimens have the short panicles and obtuse emarginate fruits of Roxburgh's figure. Of the six species mentioned by Mr. Lawson, *H. barbata*, Mull. alone should in my opinion be reduced here, Muller's specimen of it exactly resembling Roxburgh's figure in Herb. Calcutta. *Salacial laevigata*, Wight (of which there is a coloured figure in Hooker's Bot. Misc. III. 295, Suppl. t. XXXVI) in my opinion more nearly resembles *H. Grahamii*, Wight (Ill. I. 134 and Ic. 380) than *H. obtusifolia*, Roxb. I have seen no specimen of *H. rigida*, Spanoghe, but Miquel's description of it (Fl. Ind. Bat. I, pt. 2, 600) does not agree either with Roxburgh's description or with his figure of *H. obtusifolia*. Of the three Wallichian species, *H. grandiflora* (Cat. No. 4213) is a perfectly distinct good species which has been described and figured by Korthals (Verh. Nat. Gesch. p. 187 t. 39) as *H. macrantha*. *H. volubilis* (Cat. No. 4215) consists of two

things, *viz.*, *H. obtusifolia* Roxb. and *H. Grahamii*, Wight; while *H. tortuosa*, Cat. No. 4216, is a mixture of *H. obtusifolia*, Roxb. and of *H. indica*, Willd. To *H. Grahamii*, Wight, Mr. Lawson (*l. c.* p. 624) has reduced the plant issued by Wallich as his No. 4214, under the name *H. lanceolata*, Ham. But in my opinion this reduction is wrong. Under *H. Arnottiana*, Wight, Mr. Lawson proposes to include *Salacia terminalis*, Thwaites, which is a tree with cymose panicles on long peduncles much longer than the leaves.

Doubtful Species.

HIPPOCRATEA MAINGAYI, Laws. in Hook. fil. Fl. Br. Ind. I, 625. Branches terete. *Leaves* coriaceous, lanceolate, glabrous, 3 in. long by ·75 in. broad. *Cymes* 3-flowered, racemose. *Carpels* triquetrous, woody, 4 to 5 in. long. *Seeds* oblong, 3·5 to 4·5 in. long.

Malacca: Maingay, (Kew Distrib.) No. 397. DISTRIB. ? Borneo.

Known only by Maingay's imperfect descriptions. (The above description is copied from Lawson *l. c.*)

11. SALACIA, Linn.

Scandent or sarmentose shrubs or small trees. *Leaves* opposite, rarely alternate, petiolate, exstipulate. *Flowers* few or many, clustered in the axils of the leaves or extra-axillary, more rarely in cymes. *Calyx* small, 5-parted. *Petals* 5, imbricate. *Stamens* 3, rarely 2 or 4, continuous with the disc, recurved. *Ovary* conical, immersed in the disc, 3-celled; style very short, stigma simple or 3-lobed; ovules 2–8 in each cell, in 1–2 series, inserted on the inner angle. *Fruit* baccate, 1–3-celled, sub-woody or fleshy. *Seeds* large, angular.—DISTRIB. Species about 130; natives of the tropics of both hemispheres.

Leaves alternate ... ... 1. *S. viminea.*
Leaves opposite.
  Flowers solitary or in pairs from the leaf-axils, not on tubercles... .. .. 2. *S. Maingayi.*
  Flowers in pedunculate axillary cymes.
    Flowers campanuloid; the petals erect in their lower half, spreading in the upper ... ... 3. *S. campanuloidea.*
    Petals spreading from the base.
      Leaves serrate-crenate ... ... 4. *S. Griffithii.*
      Leaves entire ... ... 5. *S. Perakensis.*
  Flowers from short axillary tubercles.
    Flowers ·35 to ·45 in. in diam.
      Leaves 6 to 12 in. long.
        axillary tubercles each bearing 10 or 12 flowers ... ... 6. *S. Scortechinii.*
        axillary tubercles bearing only 3 to 6 flowers ... ... 7. *S. grandiflora* var. *longifolia.*

Leaves not more than 6 in. long.
Main nerves of leaves 7 to 9 pairs ... 7. *S. grandiflora.*
Main nerves of leaves 4 to 6 pairs ... 8. *S. latifolia.*
Flowers ·25 in. diam.
Petals broadly cordate, obtuse, often clawed at the base; flower-pedicels ·25 to ·35 in. long ... 9. *S. prinoides.*
Petals broadly elliptic; flower-pedicels ·5 to ·65 in. long ... 10. *S. polyantha.*
Flowers ·1 to ·15 in. diam.
Leaves broadly elliptic, cuspidate; petals sub-erect, oblong ... 11. *S. Wrayi.*
Leaves oblong-lanceolate; petals orbicular, spreading ... 12. *S. Kunstleri.*
Leaves oblong or elliptic-oblong, much reticulate and yellowish when dry.
Leaves sub-acute; flowers ·15 in. in diam., the disc convex ... 13. *S. flavescens.*
Leaves obtuse; flowers ·1 in. in diam., disc saucer-like ... 14. *S. Lawsoni.*
Imperfectly known species.
S. Lobbii.
S. rubra.

1. Salacia viminea, Wall. Cat. 7267. A glabrous scandent shrub. *Leaves* membranous, usually alternate, lanceolate, shortly and bluntly acuminate, entire, the base cuneate; main nerves 5 to 7 pairs, oblique, faint; length, 2·5 to 4 in., breadth ·8 to 1·5 in., petiole ·2 to ·3 in. *Flowers* ·15 in. in diam., on thin pedicels ·3 in. long, usually solitary or in groups of 2 or 3 (rarely in cymes), from minute bracteolate tubercles, axillary or extra-axillary. *Calyx* cupular, flat, with 5 triangular concave lobes. *Petals* 5, rotund or ovate, thin, larger than the calyx-lobes. *Disc* very convex, fleshy, glabrous, with a pale zone at the base. *Stamens* 3; the filaments very broad, flat, triangular, erect; *anthers* transversely oblong, dehiscing by 2 transverse 2-celled apical slits. *Ovary* sunk in the disc, 3-angled, conical; *stigma* small. *Fruit* (young) sub-globular, glabrous. Laws. in Hook. fil. Fl. Br. Ind. I. 627. *S. alternifolia*, Scort. MSS. in Herb. Calc.

Penang; Wallich. Perak; King's Collector No. 374; Scortechini, No. 1811.

The alternate leaves are the best mark of the plants thus named. I think it however possible that two species are included under these alternate-leaved specimens. Those with flowers in short cymes may belong to a different plant from those with flowers solitary or on tubercles. The material is not good; and, in the absence of complete flowering and fruiting specimens, it is difficult to differentiate species of *Salacia* when the leaves present no good head marks, as the structure of the flowers is very much alike in many species.

2. Salacia Maingayi, Laws. Hook. fil. Fl. Br. Ind. I, 626. A scandent shrub 6 to 15 feet long; branches rather slender, terete, pale-brown when dry and with minute warts. *Leaves* coriaceous, ovate, elliptic or oblong-elliptic, shortly cuspidate, entire, the base rounded; both surfaces glabrous, shining; main nerves 5 to 7 pairs, slightly prominent on the lower; length 2·5 to 4·5 in., breadth 1·25 to 2·25 in., petiole ·25 to ·3 in. *Flowers* solitary or in pairs, axillary, not on tubercles, ·45 in. in diam.; their pedicels stout, about ·3 in. long. *Calyx* fleshy, cupular, with 5 short reniform spreading lobes. *Petals* 5, much larger than the calyx, oblong or oblong-obovate, sub-rotund, obtuse, rather fleshy, concave, glabrous, spreading. *Disc* very deep, fleshy, glabrous. *Stamens* 3, attached to the upper part of the disc; the filaments short, flattened, triangular, recurved and closely applied to the disc; *anthers* transversely oblong, dehiscing transversely. *Ovary* conical, 3-angled, sunk in the disc at the base and confluent with it, 3-celled. *Style* none, *stigma* with 3 radiating lobes. *Fruit* unknown.

Malacca; Maingay. Perak; King's Collector Nos. 6639 and 7471.

This resembles *S. grandiflora*, Kurz, but the flowers are solitary or in pairs from the axils of the leaves, and they are not inserted on tubercles; the petals are also oblong or oblong-obovate. Moreover this is scandent, while *S. grandiflora* is an erect shrub.

3. Salacia campanuloidea, King, n. sp. A glabrous creeper 50 feet long; young branches 4-angled, slender, pale when dry. *Leaves* thinly coriaceous, ovate or elliptic-oblong, widest above the middle, the apex obtuse and shortly cuspidate; the edges pale, thickened and wavy, crenulate in the lower, remotely serrulate in the upper half, slightly narrowed in the lower third to the base; both surfaces (but especially the lower,) pale and often purplish when dry; main nerves 6 to 8 pairs, spreading, faint; length 3 to 4·5 in., breadth 1·35 to 2 in., petiole ·3 to ·4 in. *Cymes* short, axillary, few-flowered. *Flowers* campanulate, ·15 to ·2 in. in diam. at the mouth; their pedicels about as long as themselves or longer, slender. *Cymes* solitary, axillary, not longer than the petioles, pedicelled, with numerous bracteoles at the apex where the pedicels are inserted. *Calyx* fleshy, spreading, deeply divided into 5 transversely oblong obtuse suberect lobes. *Petals* 5, fleshy, broadly obovate-elliptic with broad bases, glaucous (especially externally) erect, spreading at the apex so as to form a campanulate corolla. *Disc* conical with truncate apex, fleshy, pale. *Stamens* 3, inserted near the upper edge of the disc; the filaments flattened, as long as the ovary, at first erect then recurved horizontally across the disc; *anthers* large, transversely oblong, 2-celled. *Ovary* conical, buried in the disc, style

rather long, stigma small. *Fruit* when ripe sub-globular or pyriform, glabrous, 1·5 to 2 in. in diam., sometimes nearly 3 in. long, and of a dark yellowish red colour.

Perak: King's Collector, No. 2708, 3198, 4410, 5953, 6488 and 10747; Scortechini.

4. Salacia Griffithii, Laws. in Hook. fil. Fl., Br. Ind. I, 628. *Leaves* coriaceous, elliptic-oblong, shortly and bluntly acuminate, the edges serrate-crenate, the base sub-cuneate; both surfaces glabrous, minutely reticulate; main nerves 5 to 7 pairs, ascending, curving; length 4·5 to 5 in., breadth 2 in., petiole ·3 in. *Cymes* solitary, axillary, on peduncles ·6 to ·75 in. long, divaricating, about 1 in. in diam. *Flowers* less than 20, ·1 in. long, on pedicels shorter than themselves. *Calyx* puberulous, a shallow cup deeply divided into 5 rotund-ovate concave lobes. *Petals* 5, erect, much longer than the calyx-lobes, thick, oblong, puberulous, the point slightly inflexed, the apex apiculate. *Disc* very convex, fleshy, glabrous; *stamens* 3, inserted on its upper edge; filaments erect, broad; anthers reniform. *Ovary* buried in the disc. *Fruit* unknown.

Penang: Curtis No. 692.

5. Salacia Perakensis, King, n. sp. Scandent; young branches dark-coloured when dry, lenticellate. *Leaves* elliptic, shortly and bluntly acuminate, entire, the base minutely cordate; both surfaces shining, minutely reticulate; main nerves 4 or 5 pairs, ascending, curving, faint; length 2 to 2·75 in., breadth 1 to 1·35 in., petiole ·2 in. *Cymes* axillary, ·3 to ·45 in. in diam., on peduncles ·3 to ·75 in. long, 5- to 8-flowered. *Flowers* ·15 in. long, on pedicels shorter than themselves. *Calyx* cupular, shallow, fleshy, deeply divided into 5 rotund concave lobes. *Petals* 5, erect, fleshy, oblong, concave, apiculate, puberulous, much longer than the calyx. *Disc* thick, cylindric. *Anthers* 3, sessile on the convex apex of the disc, large, transversely oblong, 2-celled. *Ovary* buried in the disc, conical, stigma minute. *Fruit* unknown.

Perak: Scortechini, No. 1042.

6. Salacia Scortechinii, King, n. sp. A tall robust climber; young branches rather stout, pale-brown when dry, lenticellate. *Leaves* coriaceous, opposite, oblong or oblong-elliptic, sometimes slightly obovate, sub-acute, the edges entire, the base usually narrowed but sometimes rounded; both surfaces glabrous, the upper shining, the lower dull, not reticulate; main nerves 6 to 8 pairs, slightly prominent beneath; length 6 to 10 in., breadth 2·25 to 3·5 in.; petioles ·6 to ·75 in., stout. *Flowers* ·35 in. in diam., glabrous, rather numerous (10 to 12) on very short woody axillary tubercles, their pedicels ·35 or ·4 in. long. *Calyx* cupular, divided to the base into 5 shallow broad sub-reniform

lobes. *Petals* 5, much longer than the calyx, thick, spreading, orbicular. *Disc* broad, convex, fleshy. *Stamens* 3, inserted near the apex of the disc; the filaments broadly triangular, compressed; *anthers* small. *Ovary* flat, buried in the disc, the short conical thick style protruding; ovules 3 in each cell. *Fruit* unknown.

Perak: Scortechini, No. 1848.

This is known only by the late F. Scortechini's scanty specimens. It is a very distinct species.

7. Salacia grandiflora, Kurz in Journ. As. Soc. Beng., 1872, pt. 2, p. 300. A shrub or small tree; young branches rather slender, their bark pale when dry. *Leaves* coriaceous, oblong-elliptic or elliptic, shortly cuspidate, the edges entire, the base slightly narrowed or rounded; both surfaces glabrous, the upper very shining and reticulate; main nerves 7 to 9 pairs, ascending, curved, slightly prominent; length 5 or 6 in., breadth 2·25 to 3·25 in., petiole ·5 in. *Flowers* glabrous, ·25 to ·45 in. in diam., in groups of 3 to 6 from very short axillary or extra-axillary bracteolate tubercles; their pedicels ·2 in. long. *Calyx* cupular, deeply divided into 5 sub-orbicular fleshy segments. *Petals* 5, orbicular or obovate-orbicular, concave, spreading. *Disc* very convex, fleshy, glabrous. *Stamens* 3, inserted towards the apex of the disc; the filaments broad, triangular, recurved. *Ovary* buried in the disc, the 3-angled style alone protruding, stigma small. *Fruit* globular or ovoid, glabrous, 1 to 1·25 in. diam., the calyx and corolla persistent at the base while young about 1·5 in. long when ripe. Kurz For. Flora Burma, I, 259; Laws in Hook. fil. Fl. Br. Ind. I, 626.

Malacca: Griffith. Perak: King's Collector, Nos. 5924 and 7579. Distrib.—Tenasserim (Kew Distrib.), No. 891.

Kurz describes his *S. grandiflora* (Journ. As. Soc. Beng., pt. 2, p. 300), as scandent, and as having its flowers on minutely bracteolate axillary or extra-axillary tubercles. He has with his own hand written the name *S. grandiflora* on various specimens in the Calcutta Herbarium which, although they have all axillary tubercles, shew no evidence of being scandent. These sheets are as follows:—Helfer, Tenasserim or Andamans (Kew Distrib.), Nos. 898 and 891; Griffith, Malacca (without number); and Wall. Cat. No. 2812 from Penang. These in turn agree with various specimens from Penang, Perak, Singapore and Malacca which are described by their collectors as small erect shrubs, and not scandent. The character of being scandent must therefore be eliminated from Kurz's diagnosis of *S. grandiflora*. In this view Mr. Lawson appears to agree, for he describes both *S. grandiflora* and *S. longifolia* Hook. fil. (which I reduce to a variety of *S. grandiflora*) as small trees. There *is* however a *scandent* species very closely re-

sembling the foregoing in leaves, the flowers of which are not on tubercles but arise singly or in pairs from the leaf-axils, and this I have named *S. macrantha*.

As in the case of *S. flavescens*, there is a considerable range in the size of the flowers of *S. grandiflora*, some measuring only ·25 in. diam., while others are ·45 in. There is also some difference in the shape of the leaves. The specimens with very long, comparatively narrow, leaves have been accepted as a species by Mr. Lawson. But I cannot find that these differ in their flowers from Helfer's No. 898 (Kew Distrib.) which Kurz, the author of this species, has named *S. grandiflora* with his own hand. I therefore treat these as a variety only.

Var. *longifolia*. Leaves oblong or oblong-oblanceolate, the base much narrowed, 9 to 12 in. long. *S. longifolia*, Hook. fil. in Fl. Br. Ind. I, 626; Kurz For. Flora Burma, I, 258.

Malacca: Maingay (Kew Distrib.) No. 400². Perak: Wray. Distrib.—Tenasserim, Helfer (Kew Distrib.) No. 898. Penang: Curtis, Nos. 134, 1146, 1266, 2939.

8. Salacia latifolia, Wall. Cat. 4222. A scandent glabrous shrub many feet in length; young branches slender, terete, dark-coloured when dry. *Leaves* thinly coriaceous, elliptic to elliptic-rotund, obtuse or shortly cuspidate, entire, the base rounded; upper surface pale-greenish when dry, the lower pale-brown; main nerves 4 to 6 pairs, spreading, forking far from the margin, slightly prominent beneath; length 3 to 6 in., breadth 2 to 3·5 in., petiole ·5 in. *Flowers* ·4 in. in diam., in fascicles of 6 to 8 from short axillary tubercles, pedicels about ·5 in. long. *Calyx* cupular, with 5 broad reniform blunt lobes. *Petals* 5, much longer than the calyx-lobes, obovate, blunt, spreading or recurved. *Disc* large, thick, glabrous. *Stamens* 3, inserted near the upper edge of the disc; the filaments long, flat, recurved; the anthers transversely oblong, 2-celled. *Fruit* globose, smooth, 1 in. in diam.; seeds ·75 in. long, semi-convex, slightly rugose. Hook. fil. Fl. Br. Ind. I, 629. *S. platyphylla*, Kurz in Journ. As. Soc. Beng. for 1875, pt. 2, p. 203.

Singapore; Wallich. Pangkore: Scortechini, Nos. 39, 951. Andaman and Nicobar Islands.

This is allied to *S. prinoides*, DC., but differs in being a large climber, also in having larger more rotund leaves and larger flowers and fruit.

9. Salacia prinoides, DC. Prod. 1, 571. A large straggling shrub; young branches divaricating, slender, somewhat four-angled, glabrous. *Leaves* thinly coriaceous, elliptic-oblong, shortly and obtusely cuspidate, coarsely serrate or entire, the base cuneate; both surfaces glabrous, the lower pale; main nerves 5 or 6 pairs, ascending, curved;

length 1·75 to 3·5 in., breadth 1 to 1·5 in., petiole ·15 to ·25 in. *Flowers* ·25 in. in diam., 3 to 6 from small tubercles in the axils of the leaves or from the smaller branches below the leaves; their pedicels slender, about ·25 to ·35 in. long. *Calyx* cupular, with 5 rounded concave lobes. *Petals* much larger than the calyx-lobes, broadly cordate, obtuse, often clawed at the base, the edges membranous. *Disc* broad, fleshy, convex. *Stamens* 3, from the upper edge of the disc; the filaments flat but not broad, erect: *anthers* small, transversely oblong, 2-celled. *Ovary* small, conical, 3-angled, buried in the disc. *Fruit* ovoid-globular, ·5 in. in diam., 1-celled, 1-seeded. Blume Bijdr. 221; Wall. Cat. 4219: W. and A. Prod. 105: Dalz. and Gibs. Fl. Bomb. 33; Kurz For. Flora Burma, I, 260: Miq. Fl. Ind. Bat. I, pt. 2, p. 597; Hook. fil. Fl. Br. Ind. I, 626. *S. podopetala*, Turcz. in Bull. Soc. Nat. Mosc. 1863, I, 581. *S. Wightiana*, Wall. Cat. 4221. *Johnia coromandeliana*, Roxb. Fl. Ind. I, 169; DC. Prod. I, 571. *Tonsella prinoides*, Willd. in Act. Acad. Cur. Ber. IV, 184.

In all the provinces.—DISTRIB: British India, Ceylon, the Malay Archipelago, Philippines.

Var. *macrophylla*, leaves broadly elliptic, acuminate, much narrowed at the base, 4 to 5 in. long, and 1·75 to 2·75 in. broad. *S. macrophylla*, Bl. Bijdr. 221.

Perak: King's Collector, 7552; Wray, No. 2133. DISTRIB.—Java.

10. SALACIA POLYANTHA, Korth. in Flora XXXI for 1848, p. 379. Scandent, glabrous; young branches dark-coloured when dry, minutely warted. *Leaves* coriaceous, narrowly elliptic-lanceolate, the apex shortly and obtusely acuminate, the base cuneate, the edges with remote shallow serrations; the upper surface shining when dry and sub-olivaceous, the lower dull brown; length 3·5 to 4·5 in., breadth 1·25 to 2 in., petiole ·35 in. *Flowers* about ·25 in. in diam., on slender pedicels ·5 to ·65 in. long, crowded on very short bracteolate axillary tubercles. *Calyx* flat, fleshy, with 5 rotund slightly imbricate lobes. *Petals* 5, much larger than the calyx-lobes, broadly elliptic, obtuse, concave, spreading. *Disc* very convex, fleshy, glabrous. *Stamens* 3, inserted near the upper edge of the disc: filaments flat but not very broad, short, sub-recurved; *anthers* small, transversely oblong. *Fruit* unknown.

Tongkah: Curtis, No. 2917. Kedah: Curtis, No. 2574. DISTRIB.—Borneo.

Mr. Curtis describes his Tongkah plant as a climbing shrub and his Kedah plant as a tree; but I cannot find any difference in their flowers or leaves.

11. SALACIA WRAYI, King, n. sp. A stout climber; young

branches slender, glabrous, dark-coloured when dry. *Leaves* membranous, broadly elliptic, shortly cuspidate, entire, rounded or very slightly narrowed at the base; upper surface shining, darkly cinereous when dry; the lower pale, cinereous, dull: main nerves 6 or 7 pairs, obsolete on the upper, faint on the lower surface when dry; length 1·75 to 2·5 in., breadth 1 to 1·35 in.; petiole ·3 to ·4 in., slender. *Flowers* ·15 in. in diam., their pedicels about ·2 in., in fascicles of 3 to 6 on very short axillary tubercles shorter than the petioles. *Calyx* fleshy, sub-campanulate, deeply divided into 5 broad reniform-ovate spreading teeth. *Petals* sub-erect, twice as long as the calyx-lobes, fleshy, very broadly oblong; the apex obtuse, the base broad and truncate. *Disc* cupular, fleshy, entire. *Ovary* broad, depressed, 3-angled, surrounded by the disc, stigma small. *Stamens* 3, spreading; the filaments stout, slightly flattened, recurved over the edge of the disc: *anthers* small, rounded, 2-celled. *Fruit* globular, nearly 2 in. in diam., and bright orange when ripe, glabrous, the surface much corrugated when dry especially towards the apex; pedicel very stout, ·5 in. long.

Perak: Wray, No. 2542.

12. Salacia Kunstleri, King, n. sp. A scandent shrub; young branches cinereous, glabrous, lenticellate, the bark striate when dry. *Leaves* membranous, oblong-lanceolate or oblong-oblanceolate, shortly cuspidate, much narrowed to the base, both surfaces glabrous; the lower brown when dry, the transverse reticulations very distinct; main nerves about 7 pairs, spreading and curving upwards; length 3·5 to 5·5 in. breadth 1·75 to 2·3 in., petiole ·15 in. *Flowers* ·15 in. in diam., on thin, pedicels ·5 in. long, in fascicles of 3 to 6 from very small bracteolate axillary tubercles. *Calyx* small, cupular, spreading, deeply divided into 5 concave ovate-orbicular teeth with coarsely ciliate edges. *Petals* 5, orbicular, spreading, much larger than the calyx-teeth. *Disc* flat, thin, annular, not toothed. *Stamens* 3, attached to the inner edge of the disc; the filaments very broad, triangular, recurved, *anthers* small. *Ovary* buried in the disc. *Fruit* unknown.

Perak: King's Collector, No. 683, (collected only once and probably a rare plant).

13. Salacia flavescens, Kurz, Journ. As. Soc. Bengal, for 1872, pt. 2, p. 300. A scandent shrub 40 to 60 feet long: young branches slender, black when dry and with numerous minute split warts. *Leaves* opposite, coriaceous, oblong, sub-acute, the edges entire and slightly revolute when dry, the base rounded, almost sessile: both surfaces, but especially the lower, yellowish when dry; main nerves 6 to 9 pairs, spreading, interarching far from the edge: length 4 to 7 in., breadth 1·25 to 2·5 in.; petiole about ·2 in., stout. *Flowers* about ·15 in. in

diam., in axillary clusters of 2 or 3 or on very short woody tubercles; pedicels rather longer than the flowers. *Calyx* of 5 broadly ovate acute concave sepals sometimes with coarsely ciliate edges, otherwise glabrous. *Petals* twice as long as the sepals, broadly elliptic, glabrous, the inner two sometimes with two imperfect transverse thickened bands on the upper surface. *Disc* with saucer-like wavy lower rim, the upper part fleshy and confluent with the ovary. *Stamens* 3, inserted on the disc; the filaments broadly triangular, embracing the ovary; *anthers* small, transversely elongated, 2-celled. *Ovary* immersed in the disc, conical, 3-angled, glabrous, the style protruding, the stigma small. *Fruit* globular, glabrous, 1·5 to 2 in. in diam. *Seeds* several. Kurz For. Flora Burma. I, 260: Laws. in Hook. fil. Fl. Br. Ind. I, 627. *Microtropis coriacea*, Wall. Cat. 4338. *M. lonifolia*, Wall. Cat. 4339 (in part). *Xanthochymus ovalifolius*, Wall. (not of Roxb.) Cat. 4839 B.

Malacca: Maingay (Kew Distrib.), No. 404/2. Perak: King's Collector, Scortechini, Curtis. Penang: Wallich, Curtis, No. 12. Kedah: Curtis, No. 2653. Distrib.—Tenasserim, Helfer (Kew Distrib.) No. 897.

Var. *dumosa*: a small erect shrub; flowers brick-red.

Perak: Scortechini, No. 505, 1734: King's Collector, No. 10948. Kedah: Curtis, No. 2654.

I think it probable that better acquaintance with this shrubby non-scandent variety will prove it to be quite as well entitled to specific rank as many members of this genus.

14. Salacia Lawsoni, King. A scandent shrub with smooth pruinose branches, becoming black when dry. *Leaves* sub-coriaceous, elliptic, obtuse, entire, the base rounded; both surfaces glabrous, pale yellowish-brown when dry, reticulate, shining: main nerves 6 or 7 pairs, faint; length 2·5 to 5 in., breadth 1·5 to 3 in., petiole ·2 to ·35 in. *Flowers* ·1 in. in diam., 3 to 6 from small axillary bracteolate tubercles; their pedicels slender, ·25 to ·3 in. long. *Calyx* of 5 ovoid-deltoid thick sepals. *Petals* 5, larger than the sepals, broadly ovoid, obtuse. *Disc* convex, fleshy. *Stamens* 3, inserted on the upper edge of the disc; filaments flat, broadly triangular; *anthers* small, broader than long. *Fruit* unknown. *S. ovalis*, Lawson (not of Korth.) in Hook. fil. Fl. Br. Ind. I, 627.

Malacca: Maingay (Kew Distrib.), No. 400.

A species with leaves like those of *S. flavescens*, Kurz, but with much smaller flowers: collected only by Maingay. I have been obliged to change the name of this, as there is an earlier *S. ovalis* published by Korthals in 1848 (Flora, XXXI, 579); whereas Mr. Lawson's name dates from 1875.

Imperfectly known species.

Salacia Lobbii, Laws. in Hook. fil. Fl. Br. Ind. I, 626. An erect shrub ; branches terete, covered with minute warts. *Leaves* elliptic-oblong with a short obtuse point, entire, not drying black, 3 to 3·5 in. long and 1 to 1·75 in. broad. *Flowers* 1 to 3 in each axil, thick and fleshy ; pedicels stout, 1 to 1·5 in long. *Petals* roundly ovate, sub-cordate at the base, ·25 in. long. *Fruit* unknown.

Singapore, Lobb.

This is known only by Lobb's imperfect specimen said to have been collected at Singapore. The description above given is copied from Lawson (*l. c.*)

Salacia rubra, Laws. in Hook. fil. Fl. Br. Ind. I, 627. A scandent ? shrub with coarse pale-coloured branches. *Leaves* sub-coriaceous, elliptic-lanceolate or ovate-lanceolate, acuminate, entire, the base cuneate, both surfaces glabrous, the lower paler ; main nerves 5 pairs. *Flowers* unknown. *Fruit* globose, bright red when ripe, rugose, 1·5 in. in diam., 2-seeded.

Malacca : Maingay (Kew Distrib.), Nos. 398/2 and 1525.

The above description is taken from Lawson (*l. c.*)

Order XXXII. Rhamneæ.

Shrubs or trees, erect or scandent (cirrhose in *Gouania*). *Branches* unarmed, spinous or aculeate. *Leaves* simple, alternate, or rarely opposite, usually coriaceous, often 3–5-nerved ; stipules small, deciduous or changed into prickles. *Flowers* hermaphrodite or polygamous, small, greenish, in cymes which are solitary or disposed in spikes or panicles. *Calyx* 4–5-fid ; lobes triangular, erect or recurved, usually carinate within, valvate. *Petals* 4–5, rarely 0, inserted on the throat of the calyx-tube, usually shorter than its lobes, cucullate or involute. *Stamens* 4–5, inserted with the petals and opposite to them often enclosed within their folds ; *anthers* versatile, 2-celled, dehiscing longitudinally. *Disc* fleshy and filling the calyx-tube, or thin and lining it, entire or lobed, glabrous, rarely tomentose. *Ovary* sessile, free or immersed in the disc, wholly free from the calyx-tube or more or less adherent to it, 3- rarely 2–4-celled ; style short, simple, or 2–4-cleft ; ovules 1 in each cell, erect, anatropous, raphe dorsal. *Fruit* free or girt at the base or middle by the adhering calyx-tube, 3-more rarely 1–4-celled, capsular and often winged, or drupaceous. *Seed* with fleshy albumen, rarely exalbuminous ; embryo large, erect.—Distrib. tropical and temperate regions ; species about 420.

Fruit superior.
Armed trees or shrubs; fruit drupaceous ... 1. ZIZYPHUS.
Fruit half inferior.
Unarmed erect shrubs; fruit dry, 3-celled, 3-seeded ... ... 2. COLUBRINA.
Scandent unarmed shrubs; fruit dry, 1-celled, 1-seeded (by abortion), epicarp prolonged into a long apical wing.
Fruit indehiscent, apical wing not splitting 3. VENTILAGO.
Fruit dehiscent, apical wing splitting at least at the base ... ... 4. SMYTHEA.
Fruit inferior, crowned by the persistent calyx, 3-winged or triquetrous ... ... 5. GOUANIA.

1. ZIZYPHUS, Juss.

Trees or shrubs, often decumbent or sarmentose and usually armed with sharp, straight or hooked prickles (transformed stipules). *Leaves* alternate, 3-nerved, usually coriaceous. *Flowers* fascicled, or in sessile or pedunculated cymes. *Calyx* 5-fid; lobes spreading, keeled within; tube broadly obconical. *Petals* 5, rarely 0, cucullate, deflexed. *Disc* 5–10-lobed, flat or pitted, with a free margin. *Stamens* 5. *Ovary* sunk in the disc and confluent with it at the base, 2–4-celled; styles 2–4, free, or more or less united. *Fruit* fleshy or dry, with a woody or bony 1–4-seeded 1–4-celled stone. *Seed* plano-convex, albumen 0, or very scanty.—DISTRIB. Species about 60, found in tropical Asia and America, and in the temperate regions of both hemispheres.

Leaves pubescent underneath.
Leaves uniformly tomentose beneath, broadly ovate or sub-orbicular, blunt; drupe glabrous, with much pulp and bony endocarp ... ... 1. *Z. Jujuba.*
Leaves rusty-pubescent beneath, ovate-lanceolate, oblique, acute; drupe glabrous, with scanty pulp and leathery endocarp ... ... 2. *Z. Oenoplia.*
Leaves rusty-pubescent beneath, elliptic-oblong, acute or shortly acuminate, cordate; drupe rufous-tomentose, with thin pulp and bony endocarp ... ... 3. *Z. Kunstleri.*
Leaves sparsely pubescent beneath, ovate-lanceolate, oblique, bluntly acuminate; drupe glabrous, with thin pulp and leathery endocarp ... 4. *Z. elegans.*

Leaves glabrous on both surfaces.

Cymes in thyrsoid terminal panicles, fruit tomentose ... ... 5. *Z. calophylla.*

Cymes axillary.

Sepals connivent, disc pitted, drupe glabrous 6. *Z. affinis.*

Sepals spreading, disc not pitted.

Lateral nerves of leaves either unbranched, or very faintly branched, drupe glabrous ... ... 7. *Z. glabra.*

One at least of the lateral nerves strongly branched, drupe tomentose ... 8. *Z. Horsfieldii.*

1. Zizyphus Jujuba, Lamk. Dict. III. 318. A small tree: young branches, flowers and under surfaces of leaves more or less pale or tawny-tomentose. *Leaves* ovate-elliptic, ovate or sub-orbicular, blunt, sub-entire, somewhat narrowed at the base, upper surface glabrous; length 1 to 2 in., breadth ·5 to 1·15 in.; prickles solitary or in pairs: petiole ·25 to ·5 in. *Cymes* short, lax or dense, axillary. *Calyx* flocculent outside, glabrous inside. *Petals* sub-spathulate, concave. *Disc* with 10 grooved lobes. *Ovary* glabrous, 2-celled; *styles* united to the middle. *Fruit* globose or ovoid, glabrous, fleshy, ·5 to ·75 in. in diam., yellow or orange-yellow, stone 1- or 2-celled. DC. Prodr. ii. 21; Roxb. Fl. Ind. i. 608; Wall. Cat. 4244; W. & A. Prodr. 162; Wight Ic. t. 99; Hook. Journ. Bot. i. 320, t. cxl. (1834); Dalz. & Gibs. Bomb. Fl. 49; Thwaites Enum. 74; Bedd. Fl. Sylvat. t. cxlix.; Hook. fil. Fl. Br. Ind. I, 632: Kurz For. Flora Burma, I, 266; Boiss. Fl. Orient. ii. 13; Brandis For. Flor. 86, t. 17; Trimen Fl. Ceyl. I. 280. *Z. mauritiana*, Herb. Ham. in Wall. Cat. 4245; DC. Prodr. ii. 21. *Z. Sororia*, Schult. Syst. v. 337; DC. Prodr. ii. 21. *Z. trinervius*, Roth Nov. Sp. 168, excl. var. *β. Rhamnus Jujuba*, Linn. Fl. Zeyl. 36; Rheede Hort. Mal. iv. t. 40.

Malacca and Province Wellesley, but probably introduced. Distrib. India, Affghanistan, Ceylon, China, Australia, Africa.

A widely distributed species, and therefore presenting considerable variety. The description above given refers to the plant as found in the Malay Peninsula. As a rule there are two stipular prickles, of which one is straight and the other curved. The fruit is eaten and several garden forms are found.

2. Zizyphus Oenoplia, Mill. Gard. Dict. No. 3. A scandent or straggling shrub; young branches rusty-tomentose; prickles solitary, tomentose at the base, glabrous at the apex, short, recurved. *Leaves* ovate-lanceolate, often very oblique, acute, entire or obscurely crenate-serrate, with 3 bold vertical nerves and numerous connecting ascending

branches; upper surfaces sparsely strigose, the lower densely rufescent-villous: length 1·25 to 2·25 in., breadth ·7 to 1·2 in.; petiole ·2 to ·3 in., tomentose. *Cymes* slightly longer than the petioles, subsessile, 12- to 15-flowered, pubescent. *Calyx* sparsely pubescent outside, glabrous inside. *Disc* glabrous, with 10 short deeply pitted lobes. *Styles* united to the apex. *Drupe* globular, slightly compressed, black, glabrous, shining, with scanty pulp, ·25 in. in diam., endocarp leathery. DC. Prodr. ii. 21; Roxb. Fl. Ind. i. 611; Wall. Cat. 4246; Don Prodr. 190; W. & A. Prodr. 163; Dalz. & Gibs. Bomb. Fl. 49; Thwaites Enum. 74; Hook. fil. Fl. Br. Ind. I. 634; Kurz For. Flora Burma, I, 266; Bedd. Fl. Sylv. Anal. Gen. lxix.; Brandis For. Fl. 86. *Z. albens*, Roxb. Fl. Ind. i. 607. *Z. celtidifolia*, DC. Prodr. ii. 20; Miq. Fl. Ind. Bat. I, pt. 2, p. 641). *Z. ferruginea*, Heyne in Wall. Cat. 4246, B, in part. *Z. Napeca*, Roxb. Fl. Ind. i. 612, not Willd.; Roth Nov. Sp. 159. *Z. pallens*, Wall. Cat. 4247 ? *Z. pedicellata*, Wall. Cat. 4243. *Z. rufula*, Miq. Fl. Ind. Bat. i. 643. *Z. scandens*, Roxb. Hort. Beng. 17; Wall. Cat. 7269. *Rhamnus Œnoplia*, Linn. Sp. Pl. 282.

In all the Provinces; common.—Distrib., British India, Ceylon: tropical Asia and Australia.

In Perak there is a form of this (King's Collector Nos. 5106 and 5276) with leaves rather larger than the measurements above given, and nearly glabrous.

3. Zizyphus Kunstleri, King n. sp. A scandent or straggling shrub: young shoots rusty-pubescent; spines stout, solitary, decurved. *Leaves* coriaceous, elliptic-oblong, acute or shortly acuminate, very finely serrate, narrowed to the minutely cordate base; upper surface shining, glabrous except the impressed rusty-pubescent nerves; the lower dull, rusty-pubescent especially on the 3 main vertical nerves and their lateral branches; length 4 to 6 in., breadth 2 to 3 in., petiole ·15 to ·2 in. *Cymes* 5- to 8-flowered, sub-sessile and crowded on branches 4 to 10 in. long, many of them in the axils of leaves much smaller than those of the stem. *Calyx* rusty-tomentose outside, glabrous inside; its teeth broadly triangular, acute, spreading. *Disc* with 5 broad truncate emarginate teeth, glabrous except a villous elevated ring surrounding the base of the sunk tomentose ovary. *Styles* united for half their length. *Drupe* ovoid, slightly compressed, rufous-tomentose, the persistent calyx reflexed; 1 to 1·25 in. long, and from ·5 to ·75 in. diam.; pulp scanty, endocarp woody; seed single, compressed.

Province Wellesley, King's Collector No. 1607. Perak: Wray, Nos. 1911, 3281 and 3285; King's Collector Nos. 3772 and 6853.

A very distinct species, the flowering branches of which have much smaller leaves than those of the barren branches. Named in memory

of its first collector, *H. H. Kunstler*, who sent it from Province Wellesley in 1881.

4. ZIZYPHUS ELEGANS, Wall. Cat. 4233. A straggling or scandent shrub; young branches slender, softly pubescent. *Leaves* ovate-lanceolate, bluntly acuminate, oblique, the edges obscurely glandular-serrate-crenate, the base slightly narrowed; upper surface glabrous except the pubescent nerves; the lower sparsely pubescent especially on the nerves; the middle of the 3 main bold vertical nerves unbranched, one, and sometimes both, of the lateral sending a few faint branches from one side; length 2 to 3 in., breadth ·75 to 1·25 in.; petiole ·25 to ·35 in., tomentose. *Cymes* with stalks as long as the leaves, dichotomous, 20- 30-flowered, tomentose. *Calyx* adpressed-pubescent outside, glabrous inside. *Disc* glabrous, fleshy, with 5 broad emarginate lobes, each lobe with 3 deep pits; *styles* short, slightly united. *Drupe* sub-globular, compressed, glabrous, ·3 in. in diam., pulp very thin, endocarp leathery. *M. subquinquenervia*, Miq. Fl. Ind. Bat., Suppl. 330.

Singapore; Wallich, King's Collector. Malacca; Ridley No. 1504. Maingay (Kew Dist.) No. 412. Perak: King's Collector, Nos. 4260 and 4770—DISTRIB.; Sumatra, Forbes 3137; Diepenhorst.

This species was first described by Miquel from specimens collected at Prianam in Sumatra, one of which is in Herb. Calcutta. Miquel does not describe the fruit, which differs from that of *Z. Horsfieldii* of the same author in being smaller and glabrous. This is no doubt very closely allied to *Z. Horsfieldii*, and it would have been better had Miquel transposed the names of the two; for there is much more disposition to an increase in the number of the nerves of the leaves in *Z. Horsfieldii* than in *Z. subquinquenervia*. Wallich had however, long prior to the publication of Miquel's name for this, issued leafless twigs of it as No. 4233 of his Catalogue, under the name *Z. elegans*; and this name must therefore, as the earliest, be adopted.

5. ZIZYPHUS CALOPHYLLA, Wall. in Roxb. Fl. Ind., ed. Carey, II, 366. A powerful climber; young branches dark-coloured, rusty-puberulous or glabrous, sparsely lenticellate; prickles short, recurved, usually solitary, rarely in pairs. *Leaves* coriaceous, elliptic or elliptic-oblong, shortly and obtusely acuminate, the edges minutely crenate-dentate or sub-entire; the base usually narrowed, not oblique; both surfaces glabrous, shining, the upper pale, olivaceous; main nerves 3 bold, unbranched, vertical; length 3 to 5 in., breadth 1·5 to 2·5 in., petiole ·25 to ·35 in. *Cymes* rusty-pubescent, disposed in axillary or terminal thyrsoid panicles. *Calyx* rusty-tomentose outside, glabrous inside; its teeth broadly triangular, acute, spreading. *Disc* entire. *Styles* united to near the apex. *Drupe* minutely rufous-tomentose,

ovoid or ovoid-globose, the pulp scanty and the endocarp leathery, seed solitary. Wall. Cat. 4230; Hook. fil. Fl. Br. Ind. I, 636. *Z. ornata*, Miq. Fl. Ind. Bat., Vol. I, pt. I, 642. *Berchemia calophylla*, G. Don. Gen. Syst. II, 28.

Penang; Wallich. Malacca; Griffith, No. 2046. Maingay (Kew Distrib.), No. 411. Perak, common. Singapore; Ridley, Nos. 1915, 4939. Pahang, Ridley, No. 5021. Selangor, Ridley's Collector.

A handsome and very distinct species. Ridley's Singapore No. 3646, seems to be a form of this with smaller leaves and more globular smaller fruit than usual. *Z. ornata*, Miq., of which there is a type specimen in Herb. Calcutta, differs in no respect from this.

6. Zizyphus affinis, Hemsley in Hook. Ic. Pl. t. 1544. Scandent; young branches dark-coloured, glabrous, the older often with many prominent lenticels, prickles and leaves as in *Z. calophylla*. *Cymes* solitary, axillary, on pedicels longer than the petioles, spreading, many-flowered, puberulous. *Flowers* sub-globular, opening only slightly; the calyx coriaceous, rugulose and sub-glabrous externally; its lobes broadly ovate, very concave, erect, with incurved apices, lined internally with a pale glabrous membrane. *Disc* minutely 10-crenate, pitted, glabrous. *Styles* united to the apex. *Fruit* ovoid, glabrous, ·75 in. long and ·6 in. in diam., the pulp scanty and the endocarp bony.

Perak: Wray Nos. 1885, 1886 and 1995. King's Collector Nos. 3568, 3747, 5238, 5528, 6720. Scortechini No. 192.

The leaves of this species so much resemble those of *Z. calophylla* Wall., that its author, who had very scanty material to work with, expressed some doubt whether it should not be considered as a variety of that species, rather than as a distinct one. An examination of numerous specimens with good flowers and ripe fruit, shows however that it is perfectly distinct from *Z calophylla*. Its calyx differs in fact very much from that of any other Asiatic species of this genus known to me, inasmuch as the lobes are coriaceous, cucullate, connivent and lined by a pale membrane.

7. Zizyphus glabra, Roxb. Fl. Ind. I, 614. A scandent shrub; young branches puberulous; spines short, curved, solitary. *Leaves* ovate-oblong, rarely ovate-lanceolate, shortly and obtusely caudate-acuminate, the edges serrulate or sub-entire, the base slightly narrowed, oblique, and sometimes emarginate on one side, boldly 3-nerved, nerves unbranched, both surfaces shining, glabrous except the midrib on the upper which is pubescent; length 2·5 to 3·5 in., breadth 1·25 to 1·6 in., petiole ·2 to ·4 in. *Cymes* slightly longer than the petioles, on short stalks, axillary, spreading, 10- to 20-flowered, pubescent like the outer-surface of the calyx. *Disc* with a circular hairy centre and glabrous edge with 10

obscure broad teeth. *Drupe* round or ovoid, at first puberulous, when quite ripe yellow and usually nearly glabrous, ·5 or ·6 in. in diam., stone usually 1-celled. Kurz For. Flora Burma, I, 267. *Z. venulosa* Wall. Cat. 4235.

Andaman and Nicobar Islands.—Distrib. Burma, Chittagong.

This is a perfectly good and distinct species. Mr. Lawson however, misled no doubt by Wallich's wrong identification of No. 4242 of his catalogue as *Z. glabra*, Roxb., and in the absence of an authentic specimen of the species, reduced this (in Hooker's Flora of Brit. India I, 636,) to a glabrous form of *Z. rugosa* Lamk., which is a plant with a totally different inflorescence. The nearest ally of this is undoubtedly the Indian Peninsular species *Z. trinervia* Roxb., which was published by Roxburgh in his Hortus Bengalensis in 1813 as *Z. trinervius*, and of which a full and excellent description was given as *Z. trinervia* in his Flora Indica I, 606. The synonymy of this species is rather curious, and I therefore make a note of it here. Roth described what is undoubtedly a different plant in his *Novæ Plantarum Species* (published in 1821) as a species of his own under the name *Z. trinervius*, and of that plant he describes, as var. *glabratus*, a form to which he reduces *Z. glabratus* Heyne, which is unmistakably the *Z. trinervius* of Roxburgh ; I can find no other publication of Heyne's *Z. glabratus* than this one of Roth's. Unfortunately Mr. Lawson has taken Heyne's name as that of the species, although Roxburgh's dates from 1813.

8. Zizyphus Horsfieldii, Miq. Fl. Ind. Bat., Vol. I, pt. 1, p. 643. Young branches sparsely puberulous; spines short, curved, usually solitary or with a second abortive. *Leaves* ovate-elliptic or ovate-lanceolate, acuminate, minutely serrate, the base slightly narrowed, sometimes oblique or sub-cordate, glabrous on both surfaces, the latter with a few scattered hairs on the nerves ; vertical nerves 3, bold, impressed on the upper and prominent on the lower surface, the middle one unbranched, the two lateral sending bold curved ascending branches towards the margin ; length 2·5 to 3 in., breadth 1 to 1·75 in., petiole ·3 to ·5 in. *Cymes* longer than the petioles, branched, few-flowered. *Flowers* on pedicels longer than themselves ; calyx puberulous outside, glabrous inside : *disc* tomentose with a glabrous 10-crenate wavy edge, not pitted ; *styles* united to the apex. *Fruit* globular, slightly compressed, ·5 to ·6 in. in diam., densely but minutely tawny-tomentose.

Nicobar Islands: Kurz. Singapore, Ridley, No. 6379.—Distrib. Java.

This species much resembles *Z. glabra*, Roxb., but the outer nerves of the leaves are boldly branched outwards, and the fruit is minutely tomentose. The specimens of this are scanty. When more materials

of this and of *Z. glabra*, Roxb., are obtained, it may be found impossible to keep this up as more than a variety of the older species. Ridley's Singapore specimens (No. 6379) have longer-stalked cymes than those from the Nicobar Islands or from Java. In the latter the cymes do not much exceed the petiole in length, while in the former they are, even when in flower, half as long as the leaf.

2. Colubrina, Rich.

Erect shrubs. *Leaves* alternate. *Flowers* in very short axillary cymes. *Calyx* 5-fid; tube hemispherical. *Petals* 5, clawed, springing from the margin of the disc, hooded. *Stamens* 5. *Disc*, fleshy, filling the calyx-tube. *Ovary* sunk in the disc and confluent with it, 3-celled; style 3-cleft; stigmas reflexed. *Fruit* the size of a pea, subglobose, surrounded below the middle by the remains of the calyx-tube, 3-celled, cells 1-seeded, tardily dehiscent.—Distrib. Species 18, chiefly tropical American.

Leaves broadly ovate, crenate-serrate ... 1. *C. asiatica.*
,, oblong-oblanceolate, entire ... 2. *C. anomala.*

1. Colubrina asiatica, Brongn. in Ann. Sc. Nat. Ser. I. x, 369. A glabrous unarmed shrub. *Leaves* broadly ovate, acute, crenate-serrate, (sometimes obscurely), rounded at the base; main nerves about 3 pairs, curved, ascending; length 1·5 to 3 in., breadth 1 to 2·25 in.; petiole ·4 to ·6 in., slender. *Cymes* shorter than the petioles, flowers yellowish. W. & A. Prodr. 166; Wight Ill. i. t. 74; Dalz. & Gibs. Bomb. Fl. 50; Thwaites Enum. 75; Hook. fil. Fl. Br. Ind. I, 642; Kurz For. Flora Burma, I, 268; Bedd. Fl. Sylv. Anal. Gen. lxix. *C. javanica*, Miq. Fl. Ind. Bat. vol. I, pt. 1, 649. *Ceanothus asiaticus*, Lamk. Ill. t. 129, f. 2; DC. Prodr. ii. 30; Roxb. Fl. Ind. i. 615; Wall. Cat. 4262. *C. capsularis*, Forst. Prodr. 18; DC. Prodr. ii. 32. *Pomaderris capsularis*, G. Don *Gen. Syst.* ii. 39; Burm. Zeylan. t. 48. *Rhamnus acuminata*, Colebr. in Roxb. Fl. Ind. i. 615.

Pahang, Perak, Nicobar and Andaman Islands.—Distrib.; Malay Archipelago, British India.

2. Colubrina anomala, King n. sp. A tree 30 to 40 feet high with spreading pendent branches; young shoots softly rusty-puberulous. *Leaves* oblong-oblanceolate, caudate-acuminate, entire, much narrowed to the base: upper surface glabrous, shining; the lower puberulous, liver-coloured when dry; main nerves 4 pairs, slightly curved, ascending, the lowest pair springing from the very base; length 4 to 6·5 in., breadth 1·1 to 2·25 in., petiole ·4 to ·5 in. *Cymes* axillary or crowded on the branches between the leaves, branching, many-flowered, rusty-tomentose, minutely bracteolate. *Flowers* ·15 in. in

diam., on pedicels longer than themselves. *Calyx* sparsely puberulous outside, its lobes triangular, glabrous and keeled inside. *Disc* glabrous, thick, filling the calyx tube ; *ovary* glabrous, 3-celled, the styles short, distinct, sometimes slightly reflexed. *Fruit* on a thin glabrous pedicel elongated to nearly 1 inch, depressed-globular, glabrous, ·25 in. in diam., black when dry, the withered calyx teeth forming a ring above its base.

Perak : King's Collector, Nos. 6561 and 7476.

This plant differs from the other species of the genus in the character of its foliage, and in the fact that the styles are quite short, and not united. The flowers, however, in other respects, and the fruit are exactly those of the genus.

3. Ventilago, Gaertn.

Scandent shrubs with alternate *leaves*. *Flowers* small, panicled, minutely bracteolate. *Calyx* obconic, 5-fid ; the teeth spreading, keeled internally. *Petals* 5, deltoid or obcordate, deflexed, cucullate. *Stamens* 5, adnate to the petals at the base. *Disc* 5-angled, its margin free. *Ovary* immersed in the disc, 2-celled, the style very short. *Ripe fruit* sub-globose, 1-celled, 1-seeded, surrounded at its base or middle by the adherent calyx-tube, the fruit prolonged upward above the seed-chamber into a linear or linear-oblong coriaceous apical wing. *Seed* sub-globose, exalbuminous.—Distrib. Species about 16 ; tropical.

Fruit pubescent	1.	*V. Madraspatana.*
Fruit glabrous.		
Leaves sub-acute, with 8 to 11 pairs of main nerves, fruit ·25 to ·35 in. in diam...	2.	*V. Maingayi.*
Leaves more or less shortly caudate-acuminate, with 6 or 7 pairs of main nerves...	3.	*V. leiocarpa.*

1. Ventilago madraspatana, Gaertn. Fruct. I, 223, t. 49, p. 2. Young branches and panicles pubescent. *Leaves* oblong-ovate to ovate, sub-acute, the edges entire or obscurely sinuate in the upper half, the base rounded ; main nerves 4 to 6 pairs, alternate, ascending ; upper surface glabrous, the lower glabrous or puberulous ; length 2·25 to 5 in., breadth 1·25 to 2·25 in. ; petiole ·25 to ·6 in. *Panicles* terminal and axillary, longer than the leaves, narrow, with distant short many-flowered cymose branches. *Flowers* about ·15 in. in diam., shorter than their pedicels, densely crowded. *Calyx* pubescent or puberulous outside, glabrescent inside ; *disc* velvetty. *Ovary* tomentose, *styles* more or less divergent. *Fruit* yellowish, densely pubescent, often becoming sub-glabrous with age ; the nut about ·2 in. in diam. ; the wing 1-nerved, blunt, 1·75 to 2·25 in. long and ·3 to ·4 in. broad. *V. calyculata*, Tulasne in Ann. Sc. Nat. Ser. 4, VIII. 124 ; Brandis For. Flora 96 ; Lawson in

Hook. fil. Fl. Br. Ind. I, 631 ; Kurz For. Flora Burma I, 262. *V. denticulata*, Willd. Nov. Act. Ber. iii. 417 ; DC. Prodr. ii. 38. *V. macrantha*, Tulasne in Ann. Sc. Nat. Ser. 4, viii. 123. *V. madraspatana*, Roxb. Fl. Ind. i. 629 ; Cor. Pl. i. 55, t. 76 ; Wall. Cat. 4268, in part. W. & A. Prodr. 164. *V. silhetiana, Smithiana, and sulphurea*, Tulasne in Ann. Sc. Nat. Ser. 4, viii. 125.

South Andaman.—Distrib. Throughout the hotter parts of India and Java.

Tulasne was the first to establish *V. calyculata* as a species, and he founded it upon three Indian specimens, *viz.*, Herb. Strachey and Winterbottam No. 349, Wall. Cat. 4268G. (both from Kamaon) and Wall. Cat. 4268H. (from Sylhet). The characters used by him to distinguish *V. calyculata* as a species distinct from the older *V. madraspatana*, Gaertn. are that the latter has more slender and more glabrous panicles ; that the ovary is less hairy and the styles less divergent ; the wing being attached to the base of the fruit in *V. madraspatana*, while it springs from about the middle of it in *V. calyculata*. The last character is the one most relied upon ; but, as regards it, I find no degree of constancy. I do not think the form named *calyculata* deserves rank as more than a variety of typical *V. madraspatana* Gaertn., the synonymy of which (as distinct from this variety) is as follows : Brongn. Mem. sur la Fam. des Rhamnées, Ann. Sc. Nat. for 1827, Ser. I (Vol. X) p. 358, t. 12, fig. IV ; W. & A. Prodr. 164 ; Wight Ic. 163 ; Wall. Cat. 4268, in part ; Dalz & Gibs. Bomb. Fl. 48 ; Thwaites Enum. 74 ; Brandis For. Fl. 96 ; Laws. in Fl. Br. Ind. I, 631. *V. bracteata*, Wall. Cat. 4269.

The typical form seems to occur only in Southern India and Ceylon.

2. Ventilago Maingayi, Laws. in Hook. fil. Fl. Br. Ind. I, 631. Young branches and panicles puberulous. *Leaves* thinly coriaceous, glabrous, oblong or oblong-lanceolate, sub-acute, entire, the bases narrowed ; main nerves 8 to 11 pairs, spreading ; length 2·5 to 4·5 in., breadth 1·25 to 1·75 in., petiole ·1 to ·2 in. *Panicles* narrow and spike-like, shorter than the leaves when in flower, longer when in fruit ; the branches very short, distant, cymose. *Flowers* crowded ; 1 in. in diam., about as long as their pedicels. *Calyx* puberulous outside, glabrous inside, the keels of its lobes very bold. *Disc* pubescent. *Ovary* glabrous. *Fruit* greenish-yellow, glabrous ; the nut ·25 to ·35 in. in diam. ; the wing blunt, 1-nerved, mottled with red, 3 to 3·5 in. long and about ·6 in. broad. Kurz For. Flora Burma, I, 263.

Malacca : Maingay (Kew Dist.) No. 407 ; King's Collector, No. 7721. Distrib. Tenasserim ? Cambodia !

A species easily recognised by its elongated entire thinly coriaceous leaves, and long-winged glabrous fruit. Tenasserim is given as a local-

ity for this species by its author; but if this distribution be given on the strength of Helfer's Tenasserim specimen No. 2022 (Kew Distrib.), I think it is erroneous: for that specimen does not agree with Maingay's (from Malacca) No. 407 which is the type of the species.

3. Ventilago leiocarpa, Benth. Fl. Hongkong 67; Journ. Linn. Soc. V, 77. Young shoots angled and, like the inflorescence, puberulous. *Leaves* thinly coriaceous, glabrous, ovate-oblong, more or less shortly caudate-acuminate; the edges more or less minutely crenate-serrate, sometimes entire except at the rounded or slightly narrowed base: main nerves 6 or 7 pairs, curved, ascending; length 2·25 to 3·5 in., breadth 1 to 1·1 in., petiole ·2 in. *Panicles* very narrow and spike-like, much longer than the leaves even when only in flower; their lateral branches distant, very short, cymose. *Flowers* shorter than their pedicels, ·1 in. to ·125 in. in diam. *Calyx* and disc glabrescent. *Fruit* golden yellow, glabrous: nut about ·2 in. in diam.; the wing with several vertical nerves, blunt, from 2 to 2·5 in. long and ·4 (rarely ·75 in.) broad. Lawson in Hook. fil. Fl. Br. Ind. I, 631; Kurz For. Flora Burma, I, 263. *V. madraspatana*, Benth. (not of Gaertn.) in Hook. Kew Journ. IV, 42.

Singapore: Ridley, No. 3607. Malacca; Maingay (Kew Distrib.) 406; Griffith (Kew Distrib.), Nos. 2022 and 2026. Perak; King's Collector, Nos. 6573, 7758; Wray, Nos. 2276, 2335. Scortechini, No. 2110.—Distrib. Sumatra, Java, Hongkong. A common plant.

In a few specimens the flowers are arranged in small axillary cymes; but, by the fall of the leaves, the inflorescence would be converted into narrow spikes of cymes as above described. Some of the specimens from Perak have entire leaves as much as 8 in. long and 2·5 in. broad; and these may belong to a distinct species. The species is readily distinguished by its crenate-serrate shining glabrous leaves, and by its glabrous several-nerved fruit-wings. A species from Sumatra described by Miquel (Fl. Ind. Bat. Suppl. 330) under the name of *V. lucens* must be very near to, if not identical with this. If it be identical, the name *V. lucens* (published in 1860) must take precedence of Bentham's name which was not published until 1861.

4. Smythea, Seem.

Scandent or sub-scandent unarmed woody shrubs. *Leaves* alternate, petiolate. *Flowers* in axillary fascicles, or on leafless terminal branches which form lax panicles. *Calyx-tube* obconic; the lobes 5, spreading. *Petals* 5, cucullate, broadly emarginate or 2-lobed. *Stamens* 5, not covered by the petals; the anthers incurved, didymous. *Disc* 5-angled. *Ovary* half-inferior, 2-celled: styles 2, recurved. *Capsule* with the calyx adherent to its base, ovate-lanceolate, compressed,

produced above the seed-cavity into a much elongate leathery wing 1-celled, 1 seeded, dehiscing vertically into 2 valves. *Seed* solitary, large, compressed, exalbuminous.—DISTRIB. Four species, Malayan and Polynesian.

The differences between the genera *Smythea* and *Ventilago* lie entirely in the fruit. Both have 2-celled ovaries with two styles, and in both only one ovule becomes a seed. In both the epicarp of the fruit is prolonged above the apex of the seed-chamber into a long coriaceous wing with a vertical midrib. In *Ventilago* the fruit never dehisces, and the wing never divides. In *Smythea* the seed-chamber dehisces vertically along its dissepiment, and the wing separates to some extent, from below upwards and along the mesial line, into two pieces. In *Ventilago* the mesial line has the appearance of the midrib of a leaf, being quite single: in *Smythea* the mesial line consists, in its lower part at least, of two parallel sets of fibro-vascular bundles.

Leaves entire, much and conspicuously reticulate	1. *S. reticulata.*
Leaves serrate, widest above the middle; disc and ovary glabrous	2. *S. macrocarpa.*
Leaves remotely crenate-serrate, widest below the middle; disc and ovary minutely tomentose	3. *S. calpicarpa.*

1. SMYTHEA RETICULATA, King n. sp. Young branches puberulous. *Leaves* ovate-elliptic or lanceolate, shortly acuminate, entire, with minutely cordate or rounded bases, glabrous, shining and minutely reticulate on both sides; main nerves 4 or 5 pairs, faint; length 2 to 3 in., breadth ·8 to 1·5 in.; petiole ·1 in., glabrous. *Fascicles* 12- to 15-flowered; flowers 1·5 in. in diam. *Calyx* sparsely pubescent outside, glabrous inside, its lobes erect, neither lobed nor pitted. *Ovary* tomentose. *Fruit* lanceolate, acuminate, minutely cinereous-tomentose, 2 in. long and ·8 in. broad.

Singapore: Ridley, No. 3592. Johore: Ridley, 1917. Perak: Scortechini, No. 1008.

Distinguished by its entire perfectly glabrous very reticulate leaves, glabrous petiole, hairy ovary, and lanceolate acuminate fruit.

2. SMYTHEA MACROCARPA, Hemsley in Hook. Ic. Pl. t. 1558. Young branches slender, rufous-puberulous. *Leaves* oblong-oblanceolate to obovate-elliptic, acuminate, serrate, narrowed to the slightly oblique base; both surfaces glabrous; main nerves 6 to 9 pairs, slightly curved, ascending; length 2·5 to 5 or even 7 in., breadth 1 to 1·5 or even 2 in.; petiole ·1 to ·2 in. or none. *Fascicles* about 10-flowered; the flowers ·15 in. in diam., pedicellate. *Calyx* sparsely pubescent outside, glabrous inside; its 5 lobes triangular, thick. *Disc* glabrous, neither lobed nor pitted. *Ovary* glabrous. *Fruit* leathery, oblong, obtuse, with one stout vertical double line along which dehiscence takes

place and several faint lateral lines, about 3 in. long and ·5 to ·75 in. broad. *Ventilago macrocarpa*, King MSS.

Perak: common. Penang: Curtis, No. 1751.

Var. *pubescens*, young branches tomentose; leaves pubescent on the under surface.

Perak: Scortechini, No. 2110; King's Collector, No. 7726.

3. Smythea calpicarpa, Kurz Journ. As. Soc. Bengal, Vol. XLI, (for 1872) pt. 2, p. 301; For. Flora Burma I, 264. Young branches sparsely tawny-pubescent. *Leaves* lanceolate, acuminate, remotely crenate-serrate; both surfaces glabrous but for a few scanty hairs on the 5 or 6 pairs of ascending slightly curving lateral nerves; length 2·25 to 2·75 in., breadth ·8 to 1 in.; petiole ·15 in., tomentose. *Fascicles* 3- to 10-flowered; the flowers ·15 in. in diam., pedicellate. *Calyx* hirsute outside; *disc* and *ovary* minutely tomentose. *Fruit* (unripe) coriaceous, oblong, obliquely truncate at the apex, minutely tawny-tomentose.

Andaman Islands: Helfer (Kew Distrib.), No. 2026/1; King's Collectors.

5. Gouania, Linn.

Unarmed climbing shrubs. *Leaves* alternate, petiolate. *Flowers* polygamous, in axillary or terminal spikes of cymes; rachis often cirrhose. *Calyx* superior, 5-fid; tube short, obconic. *Petals* 5, inserted below the margin of the disk, hooded. *Stamens* 5, enfolded by the petals. *Disc* filling the calyx-tube, 5-angled or stellate. *Ovary* sunk in the disc, 3-celled; style 3-cleft. *Fruit* inferior, coriaceous, crowned by the persistent limb of the calyx, 3-winged or boldly 3-angled, dehiscent. Distrib. About 50 species all tropical and mostly American.

Leaves entire; fruit triquetrous ... 1. *G. Andamanica.*
Leaves crenate or serrate; fruit winged
  Young branches glabrous; disc-lobes oblong, truncate-emarginate at the apex ... 2. *G. leptostachya.*
  Young branches rufous-tomentose; disc-lobes linear, acuminate .... 3. *G. Javanica.*

1. Gouania Andamanica, King n. sp. Young branches ferrugineous-pubescent, the older almost glabrous and striate. *Leaves* oblong-ovate, sub-acute, entire, narrowed to the base; both surfaces, but especially the lower, sparsely adpressed-pubescent; length 1·5 to 3·5 in., breadth ·75 to 2 in., petiole ·4 to ·6 in. *Spikes* 3 to 9 in. long, sometimes cirrhiferous near the base, slender, rufous-pubescent. *Flowers* in distant 3–4-flowered cymes, sessile; bracteoles numerous, linear-lanceolate, rufous-pubescent. *Disc* glabrous, with 5 linear lobes. *Styles* united near the base, ovary densely tomentose. *Fruit* oblong, boldly

triquetrous but not winged, rusty-tomentose, ·4 to ·5 in long and ·25 to ·35 in. in diam., the withered calyx very prominent at its apex.

Middle Andaman Island: common.

The nearest ally of this species is undoubtedly *G. Brandisii*, Hassk. from which however, this is easily distinguished by its more glabrous flowers, and oblong wingless fruit. This also (in its entire leaves) resembles *G. microcarpa*, DC. and the S. American species *G. discolor*, Spruce.

2. Gouania leptostachya, DC. Prod. II, 4. Young branches glabrous. *Leaves* broadly ovate, acute or shortly and bluntly caudate-acuminate, serrate or crenate in the upper three-fourths, the base rounded, sub-truncate or slightly cordate; upper surface glaberulous, minutely sub-scaberulous when dry; the lower minutely areolate when dry, glabrous except the nerves which are sometimes puberulous, length 1·75 to 3 in. *Racemes* 6 to 12 in. long, slender, pubescent. *Flowers* in distant 3–4-flowered cymes, shortly pedicelled, almost glabrous. *Disc* glabrous, with 5 oblong truncate-emarginate lobes. *Styles* united for half their length. *Fruit* broader than long, emarginate at base and apex, glabrous; length ·25 to ·3 in., breadth ·4 to ·5 in. Roxb. Corom. Pl. I, 67, t. 98 (not Lamk.); Wall. Cat. 4270: W. and A. Prod. 166: Dalz. and Gibs. Fl. Bomb. 50; Hook. fil. Fl. Br. Ind. I, 643; Kurz For. Flora Burma, I, 269; Miq. Fl. Ind. Bat. Vol. I, pt. 1, 650 (in part.) *G. Nepalensis*, Wall. in Roxb. Fl. Ind., ed. Carey, II, 417; Wall. Cat. 4272.

Perak and Andamans:—Distrib. Brit. India.

3. Gouania Javanica, Miq. Fl. Ind. Bat. I, pt. 1, p. 649. Young branches and racemes rufous-tomentose. *Leaves* ovate, acute, crenate in the upper three-fourths, the base rounded or slightly cordate; upper surface shortly pubescent especially on the nerves; under surface areolate, sparsely pubescent, the nerves rufous-tomentose; main nerves 6 or 7 pairs, very little curved, ascending; length 1·5 to 2·5 in., breadth 1·1 to 2 in., petiole ·5 in. *Spikes* ·3 to ·6 in. long, sometimes cirrhiferous near the base. *Flowers* in very short 2–4-flowered cymes, subsessile, each cyme with several sub-persistent ultimately reflexed lanceolate bracteoles. *Calyx* woolly, more or less rufescent. *Disc* glabrous, with 5 subulate marginal lobes. *Styles* united nearly to the apex. *Fruit* as in *G. leptostachya*, but one-third smaller. *M. Javanica*, Miq. Fl. Ind. Bat. Vol. I, Pt. 2, p. 649.

Malacca: Griffith; Sungei Ujong, Cantley 1855. Perak; King's Collector, Nos. 1009, 1046; Ridley, No. 3014; Wray, Nos. 3324, 4260. Distrib. Sumatra, Forbes, 1263, 2593, 2933*a*. Java.

This species has been often confounded with *G. microcarpa* DC., which it certainly resembles in some respects. I have examined a

large number of specimens of Indo-Malayan *Gouania*, and I have never seen one of true *G. microcarpa* from anywhere except Southern Peninsular British India or Ceylon. That species is characterised by sessile flowers covered externally by dense woolly white tomentum, and by glabrous usually entire or sub-entire leaves; while the flowers of *G. Javanica*, although sometimes woolly, are more or less rufescent, and the leaves are never quite glabrous or entire. The species of *Gouania* run, however, very close together, and I am not sure that it would not be better to reduce this and both *G. microcarpa* and *leptostachya* to *G. tiliæfolia* Lamk. which dates from 1791. The obscure Malayan species *G. denticulata* (Smith in Ree's Cyclop. XVI); the West Indian *G. pubescens* (Lamk. Ill. 845 t. 1, ex. Poir. II, 819); *G. dasyantha*, (Miq. Analecta Bot. Ind. III, 6) and *G. Retinaria*, DC. (*Retinaria scandens*, Gaertn. Fruct. II, p. 187 t. 120 fig. 4) appear to me, from their descriptions, to be probably all reducible also to *G. tiliæfolia*, Lamk.

Order XXXIII. Ampelideae.

Shrubs, usually climbing by tendrils, sometimes erect (*Leea*) or small trees; juice copious, watery. *Stems* angled, compressed or cylindric. *Leaves* alternate, usually petioled, simple or digitately or pedately 3–9-foliolate, rarely pinnate or decompound. *Flowers* in umbellate paniculate or spicate cymes, or spicate. *Peduncles* often transformed into simple or compound tendrils, or adhering to rocks or trees by viscid pads terminating the ultimate segments, or expanded into a broad floriferous membrane (*Pterisanthes*). *Flowers* regular, hermaphrodite, rarely unisexual. *Calyx* small, entire or 4–5-toothed or- lobed. *Petals* 4–5, distinct or cohering, valvate, usually caducous. *Stamens* 4–5, opposite the petals, inserted at the base of the disc or between its lobes; filaments short, subulate; anthers free or connate, 2-celled, introrse. *Disc* free, or connate with the petals stamens or ovary, annular or variously expanded. *Ovary* 2–6-celled; style short, slender, conical, or 0; stigma minute, or large flat and lobed; ovules 1–2 in each cell, ascending, anatropal, raphe ventral. *Berry* 1–6 celled, cells 1–2-seeded. *Seed* erect, often rugulose, albumen cartilaginous; embryo short, basal, cotyledons ovate.—Distrib. Species about 375, inhabiting the tropical and temperate regions of the whole world.

Scandent shrubs, usually bearing tendrils.

Flowers spicate or cymose. *Ovary* 3-celled, cells 2-ovuled ... ... 1. Vitis.

Flowers sessile on the dilated membranous peduncle ... ... 2. Pterisanthes.

Erect shrubs destitute of tendrils. *Petals* and *stamens* connate with the disc. *Ovary* 3–6-celled, cells 1-ovuled ... ... 3. LEEA.

1. VITIS, Linn.

Sarmentose shrubs, usually climbing by means of leaf-opposed tendrils. *Leaves* simple or 3–9-foliolate, digitate or pedate, rarely pinnate or bipinnate. *Flowers* in umbellate paniculate racemose or spicate cymes, usually ebracteate, sometimes polygamous. *Calyx* short, entire, or 4–5-toothed. *Petals* 4–5, free or cohering at the apex. *Stamens* 4–5, inserted below the margin of the disk; anthers free. *Ovary* 2- very rarely 3–4-celled; style 0 or short; stigma minute and entire, or large and 4-lobed, ovules 2 in each cell. *Berry* ovoid or globose, 1-2-celled; cells 1–2-seeded.—DISTRIB. About 375 species growing mostly in the tropics and subtropics of Asia Africa and Polynesia, more rarely in America.

Note.—The genus *Vitis* as understood by Messrs. Bentham and Hooker in their *Genera Plantarum* and by Mr. Lawson in his account of the Indian species in Hooker's Flora of British India, comprises various plants which many botanical writers (and among others M. Planchon) distribute into genera which, as it appears to me, are founded on characters rather insufficient to warrant generic rank, although sufficient to form the bases of sections of one large broadly-marked genus. As the species treated of here are numerous and not very easy of identification, I have made two keys for them; the first drawn up under four sections which are considered genera by M. Planchon in his monograph of the *Ampelideæ* in M. De Candolle's *Suites du Prodromus*; the second on the principle followed by Mr. Lawson in Sir Joseph Hooker's Flora of British India.

Sect. I. *AMPELOCISSUS.* *Flowers* 4- to 5-merous; *disc* annular, adherent to the base of the ovary; *style* conical, striate, *stigma* minute; *inflorescence* thyrsoid corymbiform or cymose, the peduncle often tendril-bearing.

Inflorescence thyrsoid; leaves simple ... 1. *V. barbata.*
Inflorescence spicate or paniculate-spicate, the flowers in fascicles or solitary ... ... 2. *V. macrostachya.*
Inflorescence an elongated pendulous raceme of short spikes.
Leaves simple.
Sparsely strigose on both surfaces ... 3. *V. gracilis.*
Densely cinnamoneous-tomentose on the lower surface ... ... 4. *V. cinnamonea.*

Leaves digitate.
Both surfaces of leaflets glabrous ... 5. *V. polystachya.*
Upper surfaces of leaflets glabrous except the midrib and main nerves.
Lower surface with pale cobwebby pubescence ... ... 6. *V. polythyrsa.*
Lower surface rusty-pubescent.
Main nerves of leaflets 5 to 8 pairs, flowers oblong; fruit obovoid-oblong, slightly angled ... ... 7. *V. thyrsiflora.*
Main nerves of leaflets 8 to 10 pairs, flowers sub-globular; fruit oblong, boldly 3- to 4-angled ... ... 8. *V. compositifolia.*
Upper surfaces of leaflets minutely rugulose-papillose, each papilla ending in a short hair ... ... 9. *V. elegans.*

Sect. II. *Tetrastigma.* *Flowers* 4-merous, expanding; *disc* adherent to base of ovary; *style* very short; *stigma* large, dilated, 4-lobed; *cymes* axillary, corymbiform and not tendril-bearing.

Leaves simple ... ... 10. *V. Scortechinii.*
Leaves digitately 3-foliolate.
Leaflets glabrous on the upper surface, glaucous on the lower ... ... 11. *V. pedunculares.*
Leaflets glabrous on both surfaces, not glaucous.
Flowers only ·05 in. long; seeds convex on one surface, 3-ridged on the other ... 12. *V. andamanica.*
Flowers ·1 in. long.
Fruit dry; seeds 3-sided, excavated on one side ... ... 13. *V. Wrayi.*
Fruit pulpy; seeds compressed, grooved in front ... ... 14. *V. Lawsoni.*
Leaves 3- to 5-foliolate, leaflets glabrous.
Fruit pulpy; seeds compressed, concave on one surface, convex and rugulose on the other 15. *V. lanceolaria.*
Fruit dry; seeds obovoid, slightly compressed, shortly beaked, not rugulose, vertically grooved on both surfaces ... ... 16. *V. Kunstleri.*

Sect. III. *Ampelopsis.* *Flowers* 5-merous; *disc* cupular; *style* subulate, *stigma* entire; *cymes* leaf-opposed, usually dichotomous, not tendril-bearing.

Leaves digitately 3-foliolate ... ... 17. *V. semicordata.*
Leaves pinnate or bipinnate ... ... 18. *V. cantoniensis.*

Sect. IV. *Cissus*. *Flowers* 4-merous, petals more or less calyptriform; *disc* 4-lobed; *style* subulate; *stigma* minute; *inflorescence* cymose or corymbiform, leaf-opposed, not tendril-bearing.

Leaves simple; flowers in umbellate cymes.

Stems thick, succulent, 4-winged ... ... 19. *V. quadrangularis.*

Stems herbaceous or woody.

Leaves pubescent underneath, ovate-rotund, with rusty or rufescent pubescence ... 20. *V. adnata.*

Leaves quite glabrous.

Flowers not more than ·1 in. long.

Leaves coriaceous; their bases rounded or cuneate, not cordate; fruit obovoid, black ... ... 21. *V. furcata.*

Leaves membranous, usually coloured on the upper surface, ovate-lanceolate or lanceolate, their bases usually cordate rarely cuneate or rounded; fruit red ... ... 22. *V. discolor.*

Leaves membranous, broadly ovate, green, their bases deeply and widely cordate; fruit globose or obovoid ... 23. *V. repens.*

Flowers more than ·1 in. long; leaves rounded, sub-truncate or slightly sub-cordate at the base: fruit nearly 1 in. in diam. ... ... 24. *V. cerasiformis.*

Flowers ·2 in. or more in length; leaves sagittate, sub-hastate or sub-truncate at the base; fruit ·15 in. in diam. ... 25. *V. glaberrima.*

Leaves trifoliolate.

Leaflets more or less softly tomentose ... 26. *V. mollissima.*

Leaflets slightly pubescent on both surfaces 27. *V. trifolia.*

Leaves 3- to 5-foliolate; leaflets glabrous or pubescent; seeds triangular with one side convex and very rugose ... ... 28. *V. japonica.*

Leaves pedately 7- to 9-foliolate, glabrous; seeds globular with one side truncate ... 29. *V. novemfolia.*

1. Vitis barbata, Wall. in Roxb. Fl. Ind., ed. Carey, II, 478. *Stems* woody; the branches terete, sparsely covered with long dark subulate bristles and also some pale soft cobwebby hairs. *Leaves* ovate-reniform, with shortly acuminate apex and deeply cordate base, the edges unequally sinuate-dentate; upper surface when young with some scattered flexuose pale hairs especially on the nerves, when adult

glabrous or nearly so; the lower surface woolly on the nerves and with scattered hairs between, often glabrescent when old; main nerves 6 or 7 pairs, spreading, the lower one or two pairs much curved and branching outwards; length 6 to 10 in., breadth 4·5 to 9 in.; petiole 2·5 to 6 in., with pubescence like the young branches, becoming glabrous with age. *Inflorescence* thyrsoid, sericeous-tomentose, 4 to 6 in. long, on an equally long peduncle bearing a long once or twice dichotomous tendril clothed with wool and bristles. *Flowers* 4-merous, on short pedicels. *Calyx* cupular, glabrous like the separating petals. *Berry* pedicelled, globular, ·3 in. in diam., smooth, with scanty pulp and 3 or 4 compressed plano-convex shining seeds grooved on the plane surface and slightly rugulose on the convex. Wall. Cat. 5997, 5995 C. and D; Lawson in Hook. fil. Fl. Br. Ind. I, 651 *in part*; Kurz For. Flora Burma, I, 276. *Ampelocissus barbata*, Planch. in DC. Mon. Phan. V, 372. *V. lanata* Laws. (not of Roxb.) Fl. Br. Ind. I, 651, *in part.*

Andamans: King's Collectors. Distrib. Burma, Sylhet, Assam, and the base of the Eastern Himalaya.

Var. *trilobata*, leaves 3-lobed, pubescence rufous.

Perak: King's Collector, No. 1768. Distrib. Siam, Timor.

This species is distinguished by the mixture of soft pale hairs and dark subulate bristles with which the young stems petioles and tendrils are covered. The species is really an excellent one; but it has been misunderstood owing I believe mainly to a mistake of Wallich its author who issued, under the name *V. barbata*, specimens which bore the same number (5994) as his species *V. rugosa*, and which really belong to *V. rugosa*. As a rule the pubescence of *V. barbata* is pale brown, and not rufescent. But in the Perak specimens the pubescence is pale ferrugineous, and the leaves moreover are slightly three-lobed. In other respects the Perak plant agrees with specimens from Burma, the Andamans and Sylhet. *V. rugosa*, to which this species is undoubtedly allied, appears however to be quite different. It has not the characteristic bristles of *V. barbata*, and its pubescence is always rufescent. *V. rugosa* has really little affinity with *V. lanata*, Roxb. to which it has been reduced by Lawson and others.

2. Vitis macrostachya, Miq. in Ann. Mus. Lugd. Bat. I, 94. All parts quite glabrous; branches slender, sub-compressed, angled, not winged. *Leaves* coriaceous, shining, broadly ovate or oblong, shortly and abruptly acuminate, the edges with a few distant short exserted spinous teeth, the base rounded, the reticulations minute and distinct on both surfaces when dry; main nerves 5 or 6 pairs, spreading; length 3 to 6 in., breadth 2 to 3·25 in., petioles 1·2 to 1·8 in. *Spikes* very narrow, much longer than the leaves, often in lax panicles, pendulous. *Flowers*

sessile or sub-sessile, solitary or in fascicles of 2 or 3, 4-merous; buds sub-globose, under ·1 in. long. *Calyx* cup-shaped. *Fruit* oblong, succulent: *seeds* two, large, plano-convex, rugose. Laws. in Hook. fil. Fl. Br. Ind. 1, 650. *Cissus spicifera*, Griff. Notulae IV, 963. Wall. Cat. 7468 *indeterm.* *Nothocissus spicigera*, Planch. in DC. Mon. Phan. V, 406.

Malacca, Griffith (No. 1300 K. D.); Derry No. 387; Maingay, No. 426 (K. D.), Harvey. Singapore: Wallich; Ridley No. 5585. Penang, Porter. Perak: King's Collector, Nos. 2078, 3201, 6238, 12309: Wray, No. 2164; Scortechini, No. 482. Distrib. Sumatra.

Strictly speaking the name of this should perhaps be *Vitis specifera*. It is quite unlike any other Malayan *Vitis* and can be recognised at once.

3 Vitis gracilis, Wall. in Roxb. Fl. Ind., ed. Carey, II, 477. *Stems* slender, terete, not jointed, covered with sparse long rusty flexuose deciduous hair. *Leaves* broadly ovate-rotund, shortly acuminate; the base usually cordate, rarely sub-truncate, the edges with exserted bristle-teeth: upper surface very sparsely strigose. the nerves pubescent: under surfaces very sparsely strigose, the nerves bristly-pubescent: main nerves 4 or 5 pairs, curving upwards, the lower pair branching outward; length 2·5 to 3·5 in., breadth 1·5 to 2·75 in.; petiole 1 to 1·5 in., rusty-sericeous. *Inflorescence* a slender pendulous raceme of short sub-horizontal spikes borne on a long slender tendril, the rachises rusty-sericeous. *Flowers* small, 4-merous, quite glabrous. *Fruit* elliptic, smooth, glabrous, red, somewhat 3-angled, about ·5 in. long, with scanty pulp, and 4 large compressed seeds boldly ridged on the inner surface. Wall. Cat. No. 6007; Lawson in Hook. fil. Fl. Br. Ind. I, 653. *Ampelocissus gracilis*, Planch. in DC. Mon. Phan. V, 407.

Singapore: Wallich; Ridley, No. 1922. Selangor, Ridley, No. 328, Malacca; Derry. Perak: King's Collector, No. 10274; Wray, No. 1343.

4. Vitis cinnamonea, Wall. in Roxb. Fl. Ind., ed. Carey, II, 483. *Stems* woody, channelled on one side, not jointed, yellowish or rusty-tomentose. *Leaves* coriaceous, ovate-reniform, sometimes 3-lobed, occasionally 3-partite, the apex or the lobes if present shortly acuminate, the edges sinuate-dentate with bristle points, or entire with exserted bristle-teeth; upper surface glabrous, dark olivaceous when dry, the lower uniformly covered with a thin closely adherent layer of dense cinnamoneous tomentum; main nerves 5 or 6 pairs, curving, spreading, prominent, the lower pair much branched outwards; length 5 to 7 in., breadth 4 to 5 in.; petioles 2·5 to 3 in., tomentose. *Inflorescence* a slender pendulous raceme of short sub-horizontal spikes brone on a long peduncle from the slender tendril, much longer than the leaves, rufous-tomentose. *Flowers* sessile, glabrous, 4-merous, the buds sub-globular,

Calyx cupular. *Berry* sub-globular, 3-angled, ·4 in. in diam., with very scanty pulp and a single obcordate seed with muricate margins. Wall. Cat. 5989 A ; Lawson in Hook. fil. Fl. Br. Ind. I, 659. *Ampelocissus cinnamonea*, Planch. in DC. Mon. Phan. V, 408.

Penang : Wallich. Singapore : Ridley. Johore ; King. Perak : Scortechini, Wray, King's Collector,—a common plant.

5. Vitis polystachya, Wall. Cat. No. 6028 *in part*. *Stems* glabrous the older with thick corky lenticellate bark. *Leaves* 5- to 9-foliolate, often pedate ; common petiole 3 in. or more in length : leaflets coriaceous, elliptic-oblong with cuneate bases, the apices cuspidate, the edges distantly serrate ; both surfaces pale when dry, the upper shining, the lower dull and with a few scattered dark pustules : main lateral nerves 7 to 10 pairs, ascending ; length 4 to 12 in., breadth 1·5 to 4 in., petiolules ·5 to ·75 in. *Inflorescence* as in *V. thyrsiflora*, but much longer, (1 to 2 feet) with only a few flexuose pale hairs. *Fruit* globose, succulent, ·75 in. in diam. Lawson in Hook. fil. Fl. Br. Ind. I, 662. *Ampelocissus polystachya*, Planch. in DC. Mon. Phan. V, 411.

Malacca : Griffith, No. 1321 ; Maingay, No. 420.

A species of which I have seen no good specimen. It is closely allied to *V. thyrsiflora* from which the longer inflorescence and general absence of pubescence distinguish it. It is also allied to *V. polythyrsa*, Miq.

6. Vitis polythyrsa, Miq. in Ann. Mus. Lugd. Bat. I, 89. *Young stems* much warted and (like the petioles, petiolules, tendrils, inflorescence and under surfaces of the leaves) with pale, rarely rusty, rather scanty, cobwebby pubescence. *Leaves* 5- or often pedately 7-foliolate, the common petiole 3 to 5 in. long : leaflets coriaceous, elliptic or elliptic-oblong, usually with rounded (sometimes slightly oblique) bases, the middle one or two often with cuneate bases, the apices of all suddenly and shortly acuminate ; the margins, except at the base, remotely and unequally crenate and with exserted teeth ; upper surfaces glabrous except the pubescent midrib and nerves ; length 3 to 7 in., breadth 1·5 to 3 in. ; petiolues ·5 to 1 in., the outer the shorter. *Inflorescence* as in *V. thyrsiflora*, but with cobwebby, usually pale, pubescence. *Flowers* as in *V. thyrsiflora*. *Fruit* sub-globular, glabrous, ·5 in. in diam., when ripe green with a red flush. *Seeds* 4, compressed, concave on one side, ridged on the other.

Perak : Wray, Scortechini, Ridley, No. 2999, King's Collector, Nos. 2169, 6403. Johore : Ridley, No. 4178. Distrib. Sumatra, Korthals.

This species comes very near to *V. thyrsiflora*, Miq., but differs notably in the character of its pubescence. There is in the Calcutta Herbarium an original specimen of *V. polystachya*, Miq., named by the

author himself, and there is no doubt that the Perak plant is quite the same. I believe also that the Bornean species *V. Mottleyi* described by Sir Joseph Hooker in 1862 (Linn. Trans. XXIII, 165) is also the same: and, if this is so, Sir Joseph's name being the earlier must stand. *V. nitida*, Laws. in Hook. fil. Fl. Br. Ind. I, 662 should also, I believe, be reduced here.

7. Vitis thyrsiflora, Miq. in Ann. Mus. Lugd. Bat. I, 88 (excl. var. B.) Young stems, petioles, petiolules, tendrils and inflorescence densely rusty-tomentose. *Leaves* 5- to 7-foliolate, the common petiole 3 to 6 in. long; leaflets coriaceous, obovate-oblong or oblong, with cuneate bases, the outer two oblique, the apices of all shortly and abruptly caudate-acuminate; the edges in the upper half with hard cylindric exserted teeth, in the lower half entire: upper surface glabrous except the tomentose midrib and nerves; the lower rusty-pubescent; main nerves 5 to 8 pairs, ascending, prominent beneath and ending in the bristle teeth on the edge, transverse veins distinct; length 3·75 to 7 in., breadth 1·75 to 2·75 in.; petiolules ·5 to 1 in., those of the middle leaflets longest. *Inflorescence* a slender pendulous raceme of short horizontal spikes borne on a peduncle shorter than itself and proceeding from a leaf-opposed tendril. *Flowers* sessile, oblong, 4-merous, glabrous. *Calyx* truncate, petals expanding. *Fruit* obovoid-oblong, slightly angled, glabrous, with little pulp, about ·75 in. long; seeds 4. *Cissus thyrsiflora*, Blume Bijd. 187; Hassk. Pl. Jav. Rar. 453; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 604. *Ampelocissus thyrsiflora*, Planch. in Mon. Phan. V, 409 (excl. syn. *Vitis cinnamonea*, Wall. and *V. elegans*, Kurz).

Perak: Scortechini, Nos. 121, 266; Wray, Nos. 1925, 1937, 2551; King's Collector, Nos. 509, 2033, 6366. Selangor: Ridley, No. 319.

8. Vitis compositifolia, Laws. in Hook. fil. Fl. Br. Ind. I, 659. Young stems and petioles covered with soft felted semi-deciduous rufous or rusty tomentum. *Leaves* quinate, the common petiole 6 to 15 in. long; leaflets oblanceolate or obovate-elliptic, the two outer often oblique, the apices of all abruptly and shortly cuspidate, the edges with remote exserted bristle-teeth in their upper half, entire in the lower; the bases of the inner leaflets cuneate, those of the outer two unequal, the outer side rounded; upper surface finely reticulate, glabrous, but with a few scattered hairs on the nerves, the midrib pubescent; lower surface uniformly and densely rufous-tomentose: main nerves 8 to 10 pairs spreading, curved; length 6 to 10 in., breadth 2·75 to 4 in., petiolules ·5 to ·75 in. *Inflorescence* a slender pendulous raceme of short sub-horizontal spikes borne on a long peduncle and proceeding from a leaf-opposed tendril longer than the leaves, rufous-tomentose like the stems: *flowers* sub-globular, sessile, immersed in the tomentum of

the rachis but themselves perfectly glabrous, 4-merous: *calyx* truncate, petals expanding. *Fruit* oblong, 3–4-angled, glabrous, ·5 to ·75 in. long; when ripe red, with scanty pulp and 3 or 4 plano-convex seeds, the convex surface angular. *V. cinnamomea*, var. *compositifolia*, Wall. Cat. 5989 B. *Ampelopsis compositifolia*, Planch. in DC. Mon. Phan. V, 412.

Penang: Wallich. Malacca: Maingay (Kew Distrib.) No. 418; Perak: King's Collector, Nos. 826 and 5230; Scortechini.

9. Vitis elegans, Kurz in Nat. Tijdsch. Ned. Ind. XXVIII, 166. Young stems, petioles, tendrils and inflorescence covered with dense reddish-brown tomentum. *Leaves* 3-foliolate, often pedately or digitately 5-foliolate, the common petiole 3 or 4 in. long; *leaflets* coriaceous, trapezoid-oblong or broadly oblong-lanceolate, much narrowed to the base, the outer two often very unequal-sided with broad sub-truncate or sub-cordate bases, the apices of all acute or sub-acute, and the edges with remote shallow crenations and exserted bristle-teeth; upper surface covered with minute conical rugae each ending in a short white hair, the midrib and nerves rusty-tomentose: lower surface uniformly covered with dense short rusty tomentum; main nerves 6 or 7 pairs, the outer lower nerve in the lower pair of leaflets branching outwards; length 3 to 6 in., breadth 1·75 to 3 in.; petiolules ·5 in., subequal. *Inflorescence* as in *V. compositifolia*, but rather shorter and stouter; the flower buds oblong. *Fruit* unknown. Kurz Journ. As. Soc. Bengal, 1870 pt. 2, 74; Laws. in Hook. fil. Fl. Br. Ind. I, 659.

Singapore: Walker, Ridley, Hullett and others. Johore: Hullett and King. Malacca: Maingay (Kew Distrib.), No. 417. Distrib.—Bangka.

This resembles *V. compositifolia* Laws., but has more coriaceous leaves, rugulose-pubescent on the upper surface, and with shorter petioles. The inflorescence of this is also shorter and stouter, and the flower-buds are oblong rather than globular. The tomentum of this is shorter and less cobwebby and is of a darker colour. Planchon identifies this with *Cissus thyrsiflora* Bl. and it forms part of his *Ampelocissus thyrsiflora*, (DC. Mon. Phan. V, 409)—a reduction which he could hardly have proposed had he seen specimens of *C. elegans*. For although the two have many points of resemblance, their leaves are very different, those of *C. elegans* having their upper surfaces minutely rugulose-papillate, each papilla ending in a short white hair; while in *C. thyrsiflora*, Blume the upper surface is smooth and glabrous except the nerves.

10. Vitis Scortechini, King n. sp. *Branches* woody, terete, glabrous, scaberulous, not jointed. *Leaves* coriaceous, oblong-ovate, sometimes oblique and rarely broad at the base and with two unequal lobes about the middle, the apex shortly acuminate, the base minutely cordate; the edges sub-entire, waved and slightly recurved, sometimes

obscurely serrate; upper surfaces glabrous, the lower softly and shortly cinereous-pubescent especially on the nerves; main nerves about 8 pairs, curved, spreading, prominent on the lower surface; length 5 to 7 in., breadth 2·5 to 3·5 in., petiole ·75 to 1·25 in. *Cymes* compact, many-flowered, umbellate, about 1 in. in diam., on a peduncle ·5 to 1 in. long, minutely rusty-tomentose. *Flowers* small, pedicellate, 4-merous; *petals* minutely tomentose externally. *Fruit* globular, smooth, ·25 in. in diam., with scanty pulp and usually only one perfect seed, waxy-white when ripe.

Perak: Scortechini; King's Collector, Nos. 2897, 4644, 5942.

Var. *pubescens*, young stems pubescent, lower surface of leaves tomentose.

Perak: King's Collector, No. 5998.

11. Vitis peduncularis, Wall. Cat. 6024. *Stems* stout, woody, with lenticellate brown bark, the youngest rusty-pubescent. *Leaves* 3-foliolate, the common petiole 3 to 6 in. long; *leaflets* petiolulate, coriaceous, broadly ovate or elliptic, lateral pair oblique, all shortly cuspidate, the edges crenate-serrate; the base of the lateral pair unequal-sided, that of the lateral cuneate; upper surface glabrous, shining; the lower sub-glaucous, reticulate; main nerves 6 to 8 pairs, prominent on the lower surface, bearing a few scattered hairs; length 3·5 to 5·5 in., breadth 2 to 3 in.; petiolules of the lateral leaves ·5 in. long, of the terminal about ·75 in., all stout; tendrils simple. *Cymes* from the old wood, when in flower much shorter than the leaves, when in fruit almost as long, on long peduncles, umbellate, much branched in the upper part, covered with coarse short rusty pubescence. *Flowers* small, numerous, 4-merous. *Calyx* very short, flat. *Petals* pubescent, conjoined at first, their apices forming small divergent pointed processes, afterwards separating. *Stigma* 4-lobed. *Fruit* globular, somewhat depressed, ·25 in. in diam., red when ripe, 2- to 3-seeded; *seeds* triangular-obovoid. Laws. Hook. fil. Fl. Brit. Ind. I, 655. *V. pubiflora*, Miq. in Ann. Mus. Lugd. Bat. I, 74. *Cissus pubiflora*, Miq. Fl. Ind. Bat. Suppl. 516. *Tetrastigma*? *pedunculare*, Planch. in DC. Mon. Phan. V, 438.

Penang: Wallich. Malacca Maingay (Kew Distrib.), No. 423. Perak: Scortechini, No. 207; Wray, No. 366; King's Collector, Nos. 3521, 3970, 5087, 5364. Distrib.—Sumatra.

A species readily distinguished at a glance by its many-flowered much-branched cymes emerging from the old stems, and its coriaceous leaves glaucous and boldly reticulate beneath. The petals are at first conjoined, except their apices which diverge: afterwards they separate and spread slightly from the base.

12. Vitis Andamanica, King, n. spec. All parts, except the

inflorescence, glabrous; young branches striate, lenticellate, black when dry. *Leaves* thinly coriaceous, oblong to elliptic, 3-foliolate or pedately 4- to 5-foliolate, shortly cuspidate, the edges with remote shallow teeth; main nerves 6 to 8 pairs, spreading, thin, slightly prominent on the upper surface; length 4·5 to 6 in., breadth 2 to 3·5 in., petiolules ·4 to ·85 in. *Cymes* axillary, many-flowered, much branched, spreading, about 1·5 in. in diam., puberulous, on peduncles shorter than themselves. *Flowers* small, buds oblong and about ·05 in. long, 4-merous, the calyx truncate, the petals rusty-puberulous outside. *Fruit* globular-ovoid, glabrous, ·3 in. in diam., with very scanty pulp and a single large sub-compressed seed grooved on one face and 3-ridged on the other.

Andaman Islands: King's Collectors.

A species allied to *V. peduncularis* Wall. and of which very few specimens have as yet been obtained.

13. Vitis Wrayi, n. sp. King. *Stems* slender, terete, puberulous when young. *Leaves* 3-foliolate; common petiole 1 to 2 in. long; *leaflets* membranous, oblong-lanceolate, the middle one the largest; the laterals oblique, expanding towards the outer side, all shortly acuminate and coarsely and remotely serrate except at the cuneate base: main nerves 5 or 6 pairs, not prominent, spreading, curved; length 2·5 to 6 in.; breadth 1 to 2 in.; petiolules of the lateral leaflets ·2 to ·4 in., of the central ·5 to 1 ·25 in.: tendrils slender, forked. *Cymes* slender, axillary, umbellate, spreading, 1 to 2 in. in diam., on slender pedicels shorter than themselves. *Flowers* ·1 in. long. *Calyx* flat, with 4 obscure teeth, pubescent. *Petals* 4, oblong, pubescent. *Fruit* depressed-globular, glabrous, red when ripe, ·45 in. in diam., with soft fleshy epicarp. *Seeds* 2 or 3, oblong, compressed, smooth, 3-sided, slightly convex on one side and with an oblong mark, flattened on the other two sides, one of them excavated and the concavity closed by a membrane, the other side plane.

Perak: Scortechini, No. 426. King's Collector, Nos. 2847, 4050, 5120, 6426: Wray, Nos. 2749, 3945.

This in some respects resembles *V. novemfolia*, but its leaves are only 3-foliolate, and its seeds are different.

14. Vitis Lawsoni, King. *Young stems* rather slender, tubercled as are usually the older stems. *Leaves* 3-foliolate: common petiole 1·25 to 4 in. long, glabrous: leaflets oblong, tapering to each end, acuminate, the margins (except at the entire bases) remotely crenate-serrate, often very obscurely so; both surfaces glabrous; main nerves 6 to 8 pairs, obscure; length 2·5 to 4 in., breadth 1 to 1·5 in., petiolules ·25 to ·5 in. *Cymes* small, 1 in. in diam, or less, dense, subsessile or on peduncles ·25 to 1 in. long: tendrils free from the cymes, slender, often absent.

Flowers rather more than ·1 in. long, calyx truncate or obscurely 4-toothed. *Petals* 4, white. *Fruit* sub-globular, smooth, pulpy; seeds 3 or 4, compressed, grooved in front. *Vitis tuberculata*, Lawson (not of Wall.) in Hook. fil. Fl. Br. Ind. I, 656. *Cissus tuberculata*, Bl. Bijdr. 189; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 604, sub *Tetrastigma lanceolarium* Planch. DC. Mon. Phan. V, 424.

Penang: Curtis, Nos. 1580. Perak: Scortechini, No. 269. Wray, No. 1926, 2017, 2247. King's Collector, Nos. 1852, 3047, 3081, 6287, 6134.

This is no doubt closely allied to *Vitis lanceolaria*, Wall. to which Planchon reduces it. But the smaller and globular fruits, smaller leaves with fewer nerves, and the general absence of tendrils distinguish it well. This is the plant which Blume called *Cissus tuberculata*; but it is not the *Vitis tuberculata* of Wallich which becomes *Vitis rumicisperma*, Lawson. For this species Mr. Lawson keeps Blume's specific name, but he changes its generic name to *Vitis*—a course which I regret to be unable to follow, first because there is an earlier *Cissus tuberculata* than Blume's, (*viz.*, that of Jacquin dating from the years 1797 to 1804 during which that author's *Hortus Schoenbrunnensis* was published, and which is therefore the plant to which any author who reduces *Cissus* to *Vitis* ought to give the name *V. tuberculata*); second, because Blume did not call his plant *Vitis tuberculata* but *Cissus tuberculata*.

15. Vitis lanceolaria, Wall. Cat. 6013 (*most of the letters*). Whole plant except the inflorescence glabrous: *stems* sometimes boldly tuberculate. *Leaves* usually 3-foliolate, sometimes pedately 5-foliolate; common petiole 2 to 5 inches long; leaflets softly coriaceous, oblong or elliptic-oblong, tapering to each end, sometimes obovate-oblong, always shortly caudate-acuminate and the edges with remote shallow teeth; main nerves 6 to 10 pairs, spreading, slightly winged on the lower surface: length 4·5 to 6 in., breadth 1·75 to 2 75 in., petiolules ·4 to ·75 in. *Cymes* axillary, puberulous, spreading, about 1·5 in. across, on peduncles shorter than themselves. *Tendrils* rather short, forked. *Flowers* 4-merous, the stigma 4-lobed. *Fruit* globose-ovoid, as large as a cherry, white when ripe, pulpy, 1- or 2-seeded; the seeds compressed, concave on one surface, rugulose. W. and A. Prod. 128; Wight Ic. 177; Brand. For. Flora 101; Laws. in Hook fil. Fl. Br. Ind. I, 660 (*in part*); Kurz For. Flora Burma, I, 272: Trimen Flora Ceylon, I. 296. *Tetrastigma lanceolarium*, Planch. in DC. Mon. Phan. V, 424. *Vitis muricata*, Wall. Cat. 6015; W. and A. Prod. 128 Wight Ic. 740, *Cissus lanceolaria*, Roxb. Fl. Ind. I, 412: DC. Prod. I, 632; Graham Cat. Bomb. Pl. 33; Thwaites Enum. Pl. Ceyl. 63. *Cissus muricata* var. minor. Thwaites Enum. 63.

Penang: Curtis, No. 685, King. Singapore: Ridley, No. 5711. Perak: Scortechini, No. 102; Wray, No. 1889. Andamans: Kurz, King's, Collectors. DISTRIB. Java, Sumatra, British India.

Very good characters to distinguish this from its allies are that the main nerves of the leaves are in dried specimens winged on the lower surface, and that the fruit is white when ripe.

16. VITIS KUNSTLERI, King n. sp. Whole plant except the inflorescence glabrous. *Stems* slender, the younger not lenticellate and the older sparsely so. *Leaves* pedately 5-foliolate, common petiole 2 to 3 in. long, slender; leaflets oblong-lanceolate, shortly and abruptly acuminate, narrowed to the base, the outer two rounded at the base on the outer side; main nerves 7 to 9 pairs, prominent and slightly pale on the lower surface; midrib stout, pale and prominent beneath: length 2·5 to 4·5 in., breadth 1·1 in. to 1·75 in.; petiolules of the lateral leaflets ·25 in., of the others about 1 in. *Cymes* axillary, many-flowered, branching, condensed, about 1·5 in. across, on peduncles shorter than themselves, puberulous. *Flowers* ·1 in. long, oblong in bud, 4-merous; the calyx flat, obscurely toothed, petals puberulous outside; stigma broad, 4-lobed. *Fruit* globular, glabrous, ·35 in. in diam., without pulp: seeds 2, obovoid, slightly compressed, transversely rugulose, with a short beak and a vertical groove on each side, that in front being the deepest and having two narrow ridges on it, ·25 in. long.

Perak: King's Collector, Nos. 2790, 8027; Scortechini. Pahang: Ridley, No. 2835.

A species allied to *V. andamanica*, King; also closely allied to *V. pycnantha*, Coll. and Hemsl., from which however it differs in its larger size and very different seeds; the seed of that species being longer (·35 in. long), more compressed, less prominently grooved, and less rugulose.

17. VITIS SEMI-CORDATA, Wall. *var.* Scortechinii. Whole plant glabrous; *stems* dark-coloured when dry, lenticellate, without tendrils, *Leaves* 3-foliolate; common petiole 3·5 to 5 in. long: leaflets coriaceous, the middle obovate rarely ovate, the two outer elliptic, oblique; the apices of all shortly cuspidate; the edges coarsely crenate-serrate except in the lower third, the middle leaflet cuneate at the base, the other two more or less rounded outside and oblique inside at the base; both surfaces minutely reticulate, the lower paler: main nerves 6 or 7 pairs, rather prominent beneath, arching upwards: length 4 to 5 in., breadth 2·5 to 3·5 in.; petiolules of the lateral leaflets ·1 to ·2 in., that of the middle one twice as much. *Cymes* leaf-opposed, umbellately panicled, glabrous, 2 to 2·5 in. in diam. (much wider in fruit), on peduncles 1·5 to 2 in. long. *Flowers* dicœcious, numerous; buds oblong, ·15

in. in length, pentamerous; the calyx flat, obscurely toothed; petals pale outside, glabrous, oblong. *Ripe fruit* ovoid, glabrous, smooth, black, ·25 in. long; seeds 2 or 3, if 2 plano-convex, if 3 triangular-convex.

Perak: Scortechini, 313, 317.—Distrib. Java; Forbes, Nos. 823,983.

Scortechini's specimens are in fruit only, and Forbes's are in flower and have no fruits. But the two sets are so absolutely identical in other respects, that I have ventured (quite contrary to my usual practice) to describe the flowers from one set and fruit from another set of specimens. The species of which this is a variety was first issued by Wallich as No. 6020 of his catalogue, and was described by him in his own and Carey's edition of Roxburgh's Flora Indica I, 481. (1824). In his Illustrations of Himalayan Botany (1839), Royle published what is really only a glabrous form of it under the name *Cissus himalayana*, which Sir D. Brandis in his Forest Flora of the North-West Provinces of India reproduces as *Vitis Himalayana*. Lawson in Hooker's Flora of British India accepts Brandis's name as that of the species, and uses Wallich's trivial name *semi-cordata* to designate, as a variety, the form which Wallich published as a species. This state of matters I therefore propose to amend as follows:—

Vitis semi-cordata, Wall. Cat. 6020; in Roxb. Fl. Ind., ed. Carey and Wall. I, 481. *V. Himalayana*, Brandis, var. *semi-cordata*, Laws. in Hook. fil. Fl. Br. Ind. I, 656. *Parthenocissus semi-cordata*, Planch. in DC. Mon. Phan. V, 451.

Var. 1 *Roylei*. *Vitis Himalayana*, Brandis For. Flora 100; Laws. *l. c.* 655. *Ampelopsis Himalayana*, Royle Ill. Him. Bot. 149. *A. neilgheirensis*, Wight Ic. 965. *Cissus Himalayana*, Walp. Rep. I, 441. All parts glabrous, leaves membranous; flowers less than ·15 in. long.

Var. 2., *Scortechinii*. All parts glabrous; leaves obscurely serrate-crenate, sometimes almost entire, coriaceous; flowers ·15 in. long.

18. Vitis cantoniensis, Seem. Bot. Herald 370. Whole plant glabrous. *Stem* slender, cylindric. *Leaves* unequally pinnate, or the lower pair of pinnae ternately compound; common petiole from ·5 to 1 in. long; *leaflets* small, membranous, glaucous beneath, lanceolate or ovate-lanceolate, acuminate, remotely serrate in the upper two-thirds, entire and cuneate in the lower third; main nerves 3 or 4 pairs, faint; length ·75 to 1·5 in., rarely 2 in.; breadth ·5 to ·75 in., petiolules ·1 to ·2 in. *Cymes* umbellately-corymbose, dichotomous, about ·75 in. across, their peduncles about 1·5 to 2 in. long. *Flowers* sub-globular, ·1 in. long, 5-merous. *Calyx* cupular, obscurely toothed. *Petals* thick, oblong *disc* fleshy, 5-lobed. *Fruit* obovoid, glabrous, ·25 in. long, without pulp. *Seeds* 3 or 4, the back rounded, the face wedge-shaped. Laws. in Hook.

fil. Fl. Br. Ind. I, 663. *Cissus cantoniensis*, Hook. et Arn. Bot. of Beechey's Voyage 175; *C. diversifolia*, Walp. in Nov. Act. Acad. Leop. Car. Nat. Cur. XIX, Suppl. I.; Repert. Bot. Syst. V, 377; Pl. Meyen. 314. *Ampelopsis Cantoniensis*, Planch. in DC. Mon. Phan. V, 460. *Hedera hypoglauca*, Hance in Walp. Ann. II, 724.

Malacca: Griffith. Perak: Scortechini, No. 234; King's Collector, No. 2285.—Distrib. China, Cochin-China.

19. Vitis quadrangularis, Wall. Cat. 5992. *Stems* fleshy, much contracted at the nodes, 4-winged, glabrous, leafless except when young. *Leaves* broadly cordate or reniform, sometimes 2-3-lobed, crenate-serrate, glabrous. *Cymes* on short peduncles, with spreading umbellate branches; *flowers* in umbels, glabrous, 4-merous. *Berry* globose, succulent, reddish-black when ripe, acrid. W. & A. Prodr. 125; Wight Ic. t. 51; Brand. For. Fl. 100; Laws. in Hook. fil. Fl. Br. Ind. I, 645. *Cissus edulis*, Dalz. in Hook. Lond. Journ. Bot. ix. 248; Dalz. & Gibs. Bomb. Fl. 40; Thwaites Enum. 62. *Cissus quadrangularis*, Linn. Mant. 39; Roxb. Fl. Ind. i. 407; DC. Prodr. i. 628; Grah. Cat. Bomb. Pl. 33; Dalz. & Gibs. Bomb. Fl. 39; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 606; Planch. in DC. Mon. Phan. V, 509. *Sælanthus quadragonous*, Forsk. Descr. 33, t. 2.—Rheede Hort. Mal. vii. t. 41.

Malacca, Andaman Islands.—Distrib. British India, Ceylon, Java, East Africa.

20. Vitis adnata, Wall. Cat. 5998. *Stems* woody below; the young shoots more or less minutely rusty-tomentose, sub-terete when fresh but slightly furrowed. *Leaves* ovate-rotund, shortly and sharply acuminate, the edges bristle-serrate, the base deeply and widely cordate; upper surface sub-glabrous except the pubescent nerves; the lower rusty-pubescent especially on the midrib and nerves; main nerves 4 or 5 pairs, sub-ascending, prominent beneath, the lower pair branching outward; length 2·25 to 5 in., breadth 1·75 to 4 in., petiole ·75 to 2·25 in. *Cymes* numerous, corymbose, in umbels on peduncles 1 to 2 in. long, about ·5 in. across, few-flowered. *Flowers* ·1 in long, 4-merous; *calyx* tomentose outside. *Berry* obovoid-pisiform, glabrous, black when ripe, succulent, generally one-seeded. W. and A. Prod. 126; Brandis Forest Flora N. W. Ind. 100: Laws. in Hook. fil. Fl. Ind. I, 649: Trimen Fl. Ceyl. 290. *V. repens*, Wall. (not of W. and A.) 5999B. *Cissus adnata*, Roxb. Hort. Beng. Fl. Ind. I, 405: DC. Prod. I, 627: Wight. Ic t. 144: Thwaites Enum. Pl. Ceyl 62; Dalz. and Gibs. Bomb. Fl. 39. Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 606; Planch. in DC. Mon. Phan. V, 494. *C. cordata*, Wall. Cat. 6001A. *C. pyrrhodasys*, Miq. Fl. Ind. Bat. Suppl. 517. ? *C. aristata*, Bl. Bijdr. 183.

Malacca: Ridley, No. 1165. Perak: Scortechini, Nos. 129, 1146;

King's Collector, Nos. 2934; Wray, Nos. 496, 1929.—DISTRIB. Java, Sumatra, British India, New Guinea, Cochin China, Madagascar.

21. VITIS FURCATA, Laws. in Hook. fil. Fl. Br. Ind. I, 646. *Stems* woody, terete, slightly swollen at the nodes but not jointed, glabrous as are all the other parts except the inflorescence. *Leaves* coriaceous, broadly ovate, rarely ovate-oblong, shortly and bluntly acuminate, the edges faintly and remotely serrate, the base broad and rounded or narrowed and sub-cuneate; both surfaces glabrous, the lower paler; main nerves 4 or 5 pairs, spreading, ascending, the lower pair branching outwards; length 2 to 4 in., breadth 1·1 to 2·5 in. *Cymes* in spreading panicles shorter than the leaves, puberulous. *Flowers* 4-merous, pointed, the buds about ·1 in. long. *Calyx* truncate, glabrous. *Petals* minutely pubescent externally. *Fruit* obovate, glabrous, black when ripe, with scanty pulp and a single seed, about ·35 or ·4 in. long when dry.

Malacca: Maingay (Kew Distrib.), 424; Griffith, No. 1314; Derry, 382. Singapore: G. Thomson; Ridley, No. 4748. Perak: Wray, Nos. 1235,1430; King's Collector, Nos. 2716, 6315, 6858.—DISTRIB. Sumatra: Forbes, No. 2534.

Var. *pubescens*, branches of the cyme rufous-pubescent; petals almost glabrous externally.

Province Wellesley: King's Collector, No. 1606. Perak: King's Collector, Nos. 794, 6429, 8402; Scortechini, No. 299.

22. VITIS DISCOLOR, Dalz. in Hook. Kew Journ. Bot. Vol. II, (1850), 39. *Stems* woody at the base only, glabrous, not glaucous, red when young, sub-angular. *Leaves* ovate-lanceolate to lanceolate, acuminate, the edges remotely bristle-serrate, the base usually more or less deeply cordate, sometimes rounded or cuneate; both surfaces glabrous, the upper in most cases variegated with red and white, the lower purple: main nerves 5 to 7 pairs, the lower pair branching outwards; length 2·5 to 4 in., breadth ·85 to 2 in., petiole ·2 to 1·25 in. *Cymes* umbellate on slender peduncles, few-flowered, sparsely rufous-pubescent. *Flowers* ·1 in. long, oblong in bud, 4-merous. *Calyx* truncate, *petals* glabrous. *Fruit* globular, pyriform, glabrous, red when ripe and about ·2 in. in diam., pulp scanty, seed solitary. Dalz. & Gibs. Bomb. Fl. 40; Miq. in Ann. Mus. Lugd. Bat. I, 86; Laws. in Hook. fil. Fl. Br. Ind. I, 647. *V. inæqualis*, Wall. Cat. 6010; W. & A. Prodr. 125. ? *V. diversifolia*, Wall. Cat. 5996. ? *V. costata*, Wall. Cat. 6011. *Cissus discolor*, Blume Bijd. 181; Bot. Mag. 80, t. 4763; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, 606; Hassk. Pl. Jav. Rar. 453; Planch in. DC. Mon. Phan. V, 496.

Perak: Scortechini. Andamans: King's Collector.—DISTRIB. Java. Sumatra, Cochin-China, British India.

There is one form of this in which the leaves are very nearly sessile : and in many specimens the upper leaves have short petioles and rounded bases, while the lower have long petioles and cordate bases. As a rule the leaves of this plant are beautifully variegated on the upper surface, but individuals are not uncommon in which the leaves are green.

23. Vitis repens, W. and Arn. Prod. Fl. Penins. Ind. 124. *Stems* sub-terete when fresh, 4-angled when dry, glabrous, the young shoots glaucous. *Leaves* pale green, more or less broadly ovate, shortly acuminate, the margins wavy and with a few distant setose teeth, the base deeply and widely cordate; main nerves about 4 pairs, the lower branching outwards; length 2·5 to 3·5 in., breadth 1·75 to 3·25 in., petiole ·75 to 1·5 in. *Cymes* few-flowered in shortly pedunculate compound umbels or thyrses, pubescent toward the upper part. *Flowers* pointed in bud, ·1 in. long, 4-merous. *Fruit* globose or obovoid, ·15 in. in diam. when dry, usually 1-seeded with little pulp, its pedicels recurved when ripe. Laws. in Hook. fil. Fl. Br. Ind. I, 646; Kurz For. Flora Burma I, 275. *V. glauca*, Wall. (not of Roxb.) Cat. 5990 (*for the most part*). *Cissus repens*, Lamk. Encyc. 1, 31; DC. Prod. I, 628; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 605; Planch. in DC. Mon. Phan. V, 504. ? *C. cordata*, Roxb. Fl. Ind. I, 407.

Perak Wray, Nos. 1215, 1858, 2142. Andamans: King's Collector.—Distrib. British India, Java.

As was pointed out by Wallich, this differs from *V. glaberrima*, Wall. by its more deeply cordate leaves and smaller flowers. Closely allied to this must be the species named *Cissus pentagona* by Roxburgh (Fl. Ind. I. 408); but Roxburgh's description is too brief to identify a species by in such a difficult genus as *Vitis*; and he has unfortunately left no figure of *V. pentagona* at Calcutta.

24. Vitis cerasiformis, Teysm. and Binn. in Nat. Tijdsch. Ned. Ind. XXIX, 251, var. Wallichii, King. Branches with pale shining bark, obtusely 4-angled, not winged. *Leaves* oblong to ovate or ovate-oblong, rounded sub-truncate or slightly sub-cordate at the base, the apex shortly and bluntly acuminate; the edges remotely crenate-serrate, the teeth setose; main nerves 5 or 6 pairs, curved, spreading: length 2 to 4 in., breadth 1·2 to 2·4 in., petiole ·5 to ·75 in. *Cymes* few-flowered, lax, under ·5 in. in diam., in pedicelled umbels from a common peduncle ·5 to 1 in. long, sometimes in small thyrses. *Flowers* large for the genus, 4-merous; their buds ·2 in. long, pointed. *Calyx* cup-shaped, truncate; *petals* coriaceous. *Fruit* when ripe as large as a cherry and similarly coloured. *Vitis glaberrima*, Wall. 5991 (in part); Laws. in Hook. fil. Fl. Br. Ind. I, 646, (*in part*). *Cissus cerasiformis*, Planch. in DC. Mon. Phan. V, 621.

Singapore: Ridley, Nos. 1924, 6380, King. Perak: Scortechini, No. 262; Wray, No. 2858: King's Collector, Nos. 6212, 10470.—DISTRIB. Java, Forbes 480; Sumatra, Forbes, Nos. 2583, 2861*a*.

The various specimens to which I have given the varietal name *Wallichii* vary somewhat as to the form of their leaves, some having them oblong with nearly truncate bases, while others have them broadly ovate with slightly cordate bases. In all, however, the leaves are broader than those in the typical form found in Java and originally described by Teysmann and Binnindyk, the bases of which are moreover cuneate. The large flowers and fruit, both of the typical form and of the variety *Wallichii*, however, at once distinguish this from the hastate- or sagittate-leaved species which Wallich confused with it under one common name as *V. glaberrima*.

25. VITIS GLABERRIMA, Wall. in Roxb. Fl. Ind. ed. Carey, II, 476; Cat. 599, *(in part)*. A weak climber, with herbaceous sub-compressed 4-angled slightly winged glaucous stems, the bark dark when dry. *Leaves* ovate-lanceolate, with broadly sagittate-cordate sub-hastate or sub-truncate bases, always attenuated upwards to the acute apex, the edges minutely and remotely bristle-serrate-crenulate; main nerves 4 or 5 pairs, faint, spreading, the lower branching outward; length 2 to 4 in., breadth 1·2 to 1·75 in.; petiole ·6 to ·8 or even 1·5 in. in the lower leaves. *Cymes* small, ·3 to ·6 in. in diam., umbellate on short pedicels from the apex of a common peduncle ·4 to ·8 in. long. *Flowers* 4-merous. *Berry* obovoid, 2-seeded, ·15 in. in diam. when dry. W. and A. Prod. Fl. Pen. Ind. 125; Laws. in Hook. fil. Fl. Br. Ind. I, 646 *(in part)*. *Vitis hastata*, Miq. in Ann. Mus. Lugd. Bat. I, 85. *Vitis sagittifolia*, Laws. in Hook. fil. Fl. Br. Ind. I, 645. *Cissus glaberrima*, Planch. in DC. Mon. Phan. V, 498. *Cissus hastata*, Miq. Fl. Ind. Bat. Suppl. 517. *Vitis diffusa*, Laws. in Hook. fil. Fl. Br. Ind. I, 646.

Singapore: Anderson, No. 78; Hullett, No. 230, King. Malacca; King. Perak: Scortechini, Wray. Penang; Wallich, King. Kedah; Curtis No. 2606. Province Wellesley; King. Andamans and Nicobars; King's Collectors. DISTRIB. Sumatra, Bangka.

Under the name *V. glaberrima* and the number 5991, Wallich distributed two species of *Vitis* gathered partly in Penang and partly in Singapore. These two gatherings are not, as is usual with Wallich in similar cases, distinguished by letters. On two of the four sheets of No. 5991 which are now present in the Calcutta Herbarium, "Penang" is given as the locality; and these agree with the description of the species *Vitis glaberrima* from Penang which was published by Wallich in Carey's edition of Roxburgh's Flora Indica. This Penang plant agrees absolutely with type specimens of *Vitis hastata*, Miq. and *V. sagittifolia*,

Laws. On the third sheet of No. 5991 no locality is noted. On this sheet is glued down a specimen of a different species which I have identified as a variety of the one named *V. cerasiformis* by Teysmann and Binnindyk many years after the issue of Wallich's plants. The fourth sheet of No. 5991 at Calcutta is occupied by stems of the latter and a collection of leaves of both the former and latter. The *V. glaberrima* of Wall. Cat. is thus a mixed species; and as such the name would have had to be dropped had not Wallich published a description of his Penang No. 5991 under that name in Carey's edition of Roxburgh's Flora.

26. Vitis mollissima, Wall. in Roxb. Fl. Ind. ed. Carey, II, 482. *Stems* rather slender, woody, when young softly pubescent, when adult glabrous and shining. *Leaves* 3-foliolate; the common petiole 2 to 2·5 in. long, tomentose; leaflets petiolulate, the lateral pair obliquely elliptic, the terminal obovate-elliptic, all with shortly acuminate apices, and coarsely but sparsely serrate or sub-entire edges; the lateral pair with rounded or sub-cordate the terminal one with a cuneate base; upper surface sparsely adpressed-pubescent, the midrib and nerves rusty-tomentose; the lower uniformly and softly tomentose: main nerves 5 or 6 pairs, ascending, the lower branching outwards; length 3·25 to 5 in., breadth 1·75 to 2·75 in., petiolules of the lateral leaflets ·25 to ·4 in., those of the terminal twice as long; tendrils slender. *Cymes* half as long as the leaves; their peduncles 1·5 to 3 in. long, umbellate, spreading, many-branched, many-flowered, 1·5 to 2·5 in. across, minutely tomentose. *Flowers* ·1 in. long, oblong, 4-merous; *calyx* short, truncate; petals puberulous outside. *Fruit* oblong, ·75 to 1 in. long, when ripe dirty white, with scanty pulp and two large plano-convex seeds. Wall. Cat. 6012; Laws. in Hook. fil. Fl. Br. Ind. I, 656. *Cissus mollissima*, Planch. in DC. Mon. Phan. V, 575.

Penang; Wallich, Curtis No 1435. Malacca; Griffith, No. 1232; Maingay (Kew Distrib.), No. 422. Pahang: Ridley, No. 1134. Perak: King's Collector, Nos. 2744, 4223, 5848 and 10485.

27. Vitis trifolia, Linn. Sp. Pl. 203. *Stems* compressed, herbaceous, or woody near the base only, when young shortly and densely pubescent, becoming sub-glabrous with age. *Leaves* 3-foliolate, common petiole 1·25 to 2·25 in. long; leaflets shortly petiolulate, ovate, obovate or sub-rhomboid, shortly cuspidate, coarsely serrate or dentate, the bases rounded, more or less pubescent on both surfaces; main nerves 5 or 6 pairs, slightly curved and ascending; length 1·5 to 2·5 in., breadth ·8 to 1·25 in., petiolules of the lateral leaflets ·1 to ·25, of the terminal twice as much; tendrils short, slender, usually branched. *Cymes* 2 or 3 in. in diam., pubescent, on long peduncles rather exceeding the leaves, about 3-branched, the umbellules cymose. *Flowers* 4-merous,

white, about ·1 in. long; the calyx truncate, short; the petals pubescent outside. *Berry* turbinate, fleshy, 2 to 4-seeded, *seeds* triangular. *Vitis carnosa*, Wall. Cat. 6018; W. and A. Prodr. 127; Wight Ic. 171; Brand. For Fl. 101; Laws. in Hook. fil. Fl. Br. Ind. I, 654; Trimen Fl. Ceyl. I, 294; Planch. in DC. Mon. Phan. V, 570. *V. crenata*, Wall. Cat. 6021. *Cissus trifoliata*, Linn. Sp. Pl. 203. *C. auriculata*, Roxb. Wall. Cat. 6031 *b*. *C. carnosa*, Roxb. Fl. Ind. I, 409; DC. Prodr. I, 630; Grah. Cat. Bomb. Pl. 33; Dalz. and Gibs. Bomb. Fl. 40. *Crenata*, Vahl, DC. Prodr. I, 631. *C. cinerea*, Lamk.; DC. Prodr. I, 631. *C. obtusifolia*, Lamk. Dict. I, 31 ?—Rheede Hort. Mal. vii. t. 9.

Malacca; Harvey. Singapore; Hullett, No. 95. Perak: Scortechini. Andamans; King's Collector. Nicobars; Kurz.—Distrib. British India, Java.

28. Vitis japonica, Thunbg. Fl. Japan, 104. Glabrous or pubescent. *Stems* slender. *Leaves* 3-foliolate or pedately 5-foliolate; common petiole 1·5 to 2·5 in. long; leaflets membranous, ovate to oblanceolate, the outer oblique, all shortly acuminate and coarsely and unequally serrate-dentate in the upper part, entire towards the narrowed base: main nerves slightly prominent on the under surface, 7 to 9 pairs, straight, ascending; length 1·5 to 4 in., breadth ·85 to 1·75 in.; petiolules ·2 to ·5 in., that of the middle leaflet sometimes even 1 in.; tendrils slender, forked. *Cymes* spreading, branched, open, 2 to 3 in. across, always more or less puberulous. *Flowers* ovoid-globose, ·15 in. long, 4-merous. *Calyx* cupular, petals broad. *Fruit* sub-globular, somewhat depressed, glabrous, ·25 to ·3 in. in diam. *Seeds* 3 or 4, triangular, one side convex and very rugose, the other two flat and pitted, one of the pits closed by a membrane. *Cissus japonica*, Willd. Sp. Pl. I, 659; DC. Prod. I, 632; Planch. in DC. Mon. Phan. V, 561 (*in part*). *Vitis mollis*, Wall. Cat., No. 6025; Laws. in Hook. fil. Fl. Br. Ind. I, 660.

Singapore, Malacca, Perak, Penang, Nicobar and Andaman Islands: common.— Distrib. Java, New Caledonia, Australia, Japan, China.

The larger forms of this resembles *V. novemfolia*, Wall., but have not so many leaflets. The two species are however closely allied, as also are the less pubescent forms of *V. pedata*, Vahl. The seeds of this are remarkable in shape, approaching those of *V. novemfolia* but with two plane sides instead of one. This is also even more closely allied to *V. tennifolia* W. and A., from which it is indeed very often difficult to distinguish it, in the Herbarium at least.

29. Vitis novemfolia, Wall. Cat. 6030. Whole plant except the inflorescence glabrous. *Stems* slender, striate. *Leaves* membranous, usually pedately 7- to 9-foliolate; common petiole 2·5 to 3 in. long; *leaflets* oblong-lanceolate, shortly acuminate, entire or with a few exserted

bristle teeth near the apex, the base narrowed ; lower surface minutely reticulate ; length 2 to 3·5 in. breadth ·85 to 1·35 in. ; petiolules of the middle leaflets sometimes as much as 3 in. long, those of the lateral leaflets from ·28 to 1·25 in. ; *tendrils* long, slender, forked. *Cymes* axillary, puberulous, much-branched, spreading, 3 to 6 in. across, on peduncles as long as the leaves. *Flowers* broadly ovoid in bud, ·15 in. long, 4-merous ; the calyx cupular, truncate ; the petals broad, minutely puberulous externally; disc large, cupular, thin. *Fruit* ovoid or subglobular, with two deep grooves, glabrous, ·3 in. in diam., without pulp ; *seeds* 2, globular, truncate and with a deep pit on one side, the opening occluded by a membrane. Laws. in Hook. fil. Fl. Br. Ind. I, 662. *Cissus novemfolia*, Planch. in DC. Mon. Phan. V, 559.

Perak : Scortechini, No. 1728 ; King's Collector, Nos. 1245, 2736. Andamans : King's Collectors.

The plant above described agrees with Wallich's imperfect specimens from Singapore. It is readily recognised by the great inequality of the petiolules of its leaflets. The middle leaflet is usually quite free from the others and has a much longer petiolule than they have.

Species imperfectly known.

Vitis coriacea, DC. Prod. I, 632. A species from Timor too briefly described by De Candolle for accurate identification. There are in the Calcutta Herbarium specimens from the Andamans (King's Collectors, No. 5000) and from Sumatra (Forbes, No. 1344), both of which agree with a specimen in the Kew Herbarium named *V. coriacea*, DC. The Sumatra specimens have pedately 5- to 7-foliolate leaves ; the leaflets are coriaceous, glabrous, obliquely oblong or obovate-oblong, bluntly cuspidate, remotely serrate-crenate, with rounded or tapering bases ; they are 2·5 to 4. in. long and 1·35 to 1·75 in broad ; the cymes are widely branching, nearly 3 in. across when in fruit, and on short warted peduncles 1 in. long : the fruit is ovoid-globose, ·2 in. in diam., with a thick pericarp and no pulp. The seeds are large, solitary, ovoid, smooth, with shallow transverse markings and a very shallow vertical groove down each face. In the Andaman specimens the leaflets are larger and less coriaceous, the cymes are larger (6 in. wide), and the fruit and seeds are slightly longer. But the appearance and structure of the seeds is exactly the same in both ; and I believe both may be *V. coriacea*, DC.

Leaves simple, flowers 4-merous.
Flowers in umbellate cymes, not borne on tendrils.
Stems thick, succulent, 4-winged ... 19. *V. quadrangularis.*
Stems herbaceous or woody.
Leaves pubescent underneath.
Leaves oblong-ovate, with cinereous pubescence ... ... 10. *V. Scortechinii.*
Leaves ovate-rotund, with rusty or rufescent pubescence ... ... 20. *V. adnata.*
Leaves everywhere glabrous.
Flowers not more than ·1 in. long.
Leaves coriaceous, their bases rounded or cuneate, not cordate; fruit obovoid, black ... ... 21. *V. furcata.*
Leaves membranous, coloured (usually) on the upper surface, ovate-lanceolate or lanceolate, their bases usually cordate, rarely cuneate or rounded; fruit red ... ... 22. *V. discolor.*
Leaves membranous, broadly ovate, green, their bases deeply and widely cordate; fruit globose or obovoid ... 23. *V. repens.*
Flowers more than ·1 in. long; leaves rounded, sub-truncate or slightly sub-cordate at the base; fruit nearly 1 in. in diam. ... ... 24. *V. cerasiformis.*
Flowers ·2 in. or more in length; leaves sagittate, sub-hastate or sub-truncate at the base; fruit ·15 in. in diam. ... 25. *V. glaberrima.*
Flowers in much elongated simple, or sometimes branching, spikes ... ... 26. *V. macrostachya*
Flowers in tendril-bearing thyrses ... 1. *V. barbata.*
Flowers in elongated racemes of sub-horizontal spikes proceeding from tendrils.
Leaves sparsely strigose and slightly pubescent, not rufescent ... ... 3. *V. gracilis.*
The under surface of leaves and the young branches and tendrils covered with dense adherent cinnamoneous tomentum ... ... 4. *V. cinnamonea.*

Leaves compound, digitate.
Inflorescence of corymbose or umbellate leaf-opposed or axillary cymes.
Leaves trifoliolate.
Flowers usually 5-merous, tendrils absent 17. *V. semicordata.*
Flowers 4-merous, tendrils usually present.
Leaflets more or less softly tomentose 26. *V. mollissima.*
Leaflets slightly pubescent on both surfaces ... ... 27. *V. trifolia.*
Leaflets glabrous on the upper, glaucous on the lower, surface ... 11. *V. pedunculàris.*
Leaflets glabrous on both surfaces, not glaucous.
Flowers only ·05 in. long; seeds convex on one surface, 3-ridged on the other ... ... 12. *V. andamanica.*
Flowers ·1 in. long.
Fruit dry, seeds 3-sided, excavated on one side ... ... 13. *V. Wrayi.*
Fruit pulpy; seeds compressed, grooved in front ... ... 14. *V. Lawsoni.*
Leaves 3- to 5-foliolate; flowers 4-merous.
Leaflets quite glabrous.
Fruit pulpy; seeds compressed, concave on one surface, convex and rugulose on the other ... ... 15. *V. lanceolaria.*
Fruit dry; seeds obovoid, slightly compressed, shortly beaked, not rugulose, vertically grooved on both surfaces ... ... 16. *V. Kunstleri.*
Leaflets glabrous or pubescent; seeds triangular with one side convex and very rugose, the other two sides flat and one of them with a membrane-closed pit ... ... 28. *V. japonica.*
Leaves pedately 7- to 9-foliolate; seeds globular with one side plane and with a membrane-closed pit ... ... 29. *V. novemfolia.*
Inflorescence a slender pendulous much elongate raceme of short horizontal spikes borne on a leaf-opposed tendril.
Both surfaces of leaflets glabrous ... 5. *V. polystachya.*

Upper surfaces of leaflets glabrous except the midrib and main nerves.
Lower surface with pale cobwebby pubescence ... ... 6. *V. polythyrsa.*
Lower surface rusty-pubescent.
Main nerves of leaflets 5 to 8 pairs; flowers oblong, fruit obovoid-oblong, slightly angled ... ... 7. *V. thyrsiflora.*
Main nerves 8 to 10 pairs; flowers sub-globular, fruit oblong boldly 3- to 4-angled ... ... 8. *V. compositifolia.*
Upper surfaces of leaflets minutely rugulose-papillose, each papilla ending in short hair ... 9. *V. elegans.*
Leaves pinnate or bi-pinnate; flowers 5-merous ... 18. *V. cantoniensis.*

2. Pterisanthes, Blume.

Scandent tendril-bearing slender shrubs. *Leaves* simple or trifoliolate, digitate or pedate. *Flowers* small, 4–5-merous, inserted on a flattened membranous rachis, a few pedicellate on the margin, the others sessile and sunk in the tissue of the rachis. *Calyx* cupular or obscurely toothed. *Petals* deciduous. *Disc* cushion-like, 4- or 5-angled. *Style* short; *stigma* capitate. *Berry* obovoid or globose, 1 to 4-seeded.—Distrib. 4 species, all Malayan.

Leaves simple ... ... 1. *P. coriacea.*
Leaves 3-foliolate.
Adult leaves glabrous ... ... 2. *P. cissoides.*
Adult leaves rusty-tomentose beneath ... 3. *P. heterantha.*
Leaves 5-foliolate ... ... 4. *P. pedata.*

1. Pterisanthes coriacea, Korth. ex Miq. Ann. Mus. Lugd. Bat. I, 95. *Stems* slender, glabrous. *Leaves* broadly ovate, acute or acuminate, the edges distantly and sometimes obscurely glandular-dentate, slightly revolute when dry, the base minutely cordate; main nerves about 4 or 5 pairs, rather faint, spreading, the reticulations distinct, both surfaces glabrous and shining; length 3 to 5 in., breadth 1·75 to 3·35 in., petiole ·75 to 1·25 in. *Inflorescence* on a slender (often tendril-bearing) peduncle, membranous, narrowly oblong, 4 or 5 in. long and about 1 in. broad; the edges wavy, reddish when fresh. *Male flowers* 4-merous, few, distant, ·15 in. in diam., their pedicels ·5 in. long. *Female flowers* numerous. *Fruit* sessile, globular, glabrous, ·3 in. in diam. *P. polita*, Lawson in Hook. fil. Fl. Br. Ind. I, 663. *Vitis polita*, Miq. Ann. Mus. Lugd. Bat. I, 85.

In all the provinces except the Andamans and Nicobars: common.

The first author to put this plant into the genus *Pterisanthes* was Korthals who (*fide* Miquel Ann. Mus. Lugd. Bat. I, 85), thus named it in the Herbarium (at Leiden ?). Miquel regarded *Pterisanthes* as only a section of *Vitis*. He had therefore to find a name for this plant in that genus; and, finding the name *V. coriacea* pre-occupied by a species of *Cissus* (DC. Prod. I, 632), he called this *V. polita*, Miq.

Var. *araneosa*; *Leaves* often ovate-oblong, always more or less rufescent cobwebby beneath. *Vitis araneosa*, Miq. Ann. Mus, Lugd. Bat. I, 94. *Cissus araneosa*, Miq. Fl. Ind. Bat. Suppl. 517.

Perak: King's Collector, No. 646; Wray, Nos. 2556, 3015, 4621.

Mr. Wray in his field note on this says "leaves with a shining black line round the edge on the outer margin of which is a line of warm brown hair, midrib beneath reddish."

2. PTERISANTHES CISSOIDES, Blume Bijdr. 193. *Stems* glabrous, striate. *Leaves* 8-foliolate; the middle leaflet narrowly wedge-shaped, the two lateral more or less oblong, rounded on the outer side, straight on the inner, all with a few obscure distant teeth in the upper half or third, entire in the lower; both surfaces with deciduous arachnoid hairs, glabrous when adult; main nerves about 4 pairs, spreading; length 3 to 6 in., breadth 1·25 to 3 in., petioles 1·5 to 3·5 in.; petiolules of the middle leaflets twice as long as those of the lateral. Flattened floriferous rachis of the inflorescence variously lobed, from 2 to 6 in. long and less than half as broad, borne on tendril-bearing branches longer than the leaves. *Male flowers* on slender pedicels ·75 in. long, 4-merous. *Female flowers* numerous. *Fruit* globose, ·35 in. in diam., with coriaceous epicarp and about 4 seeds. Miquel in Linnaea, XVIII, 385, t. VIII; Fl. Ind. Bat. I, pt. 2, 608; Laws. in Hook. fil. Fl. Br. Ind. I, 664. *Vitis Pterisanthes*, Miq. Ann. Mus. Lugd. Bat. I, 94. *Embamma cordigera*, Griff. Notulae IV, 694: Ic. Pl. Asiat. t. 646. *Cissus involucrata*, Spreng. Syst. IV, pt. 2, 44. *Pterisanthes involucrata*, G. Don. Syst. I, 694.

Malacca: Griffith (Kew Dist.), No. 1299; Maingay. Perak: Scortechini; King's Collector, Nos. 727, 7914.—DISTRIB. Java.

3. PTERISANTHES HETERANTHA, Laws. in Hook. fil. Fl. Br. Ind. I, 664. *Stems* cobwebby when young, ultimately glabrous. *Leaves* 3-foliolate, rarely 5-foliolate, the middle leaflet more or less wedge-shaped and usually broader than the obliquely ovate-oblong laterals, (sometimes all three more or less oblanceolate), acute or shortly acuminate, remotely glandular-dentate in the upper part; upper surface glabrous except the pubescent nerves; the lower rusty-tomentose; main nerves of leaflets about 5 pairs, spreading, rather straight; length 2 to 4·5 in. breadth ·8 to 2·5 in., petioles ·8 to 1·5 in. *Flattened rachis* narrowly-oblong, sinuate, acuminate, 3 to 5 in. long and ·3 to ·75 in. broad, borne

on a tendril-bearing peduncle shorter than the leaves. *Flowers* 4–6-merous (*fide* Lawson). *Fruit* globular, ·25 in. in diam. *Embamma heterantha*, Griff. Notulae IV, 694. *Vitis rufula*, Miq. Ann. Mus. Lugd. Bat. I, 94. *Cissus involucrata*, Miq. (not of Spreng.) Fl. Ind. Bat. Suppl. 517.

Malacca : Griffith, Maingay. Perak : Scortechini ; King's Collector, Nos. 678, 1084.

There are in Herb. Calcutta two specimens from Perak (Wray, No. 1178 and Scortechini without number) which apparently belong to this species, but which have pedate leaves with 5 leaflets.

4. PTERISANTHES PEDATA, Laws. in Hook. fil. Fl. Br. Ind. I, 664. *Stems* sparsely pubescent when young, glabrous when old. *Leaves* pedate, 5-foliolate, oblanceolate; the lower two leaflets smaller, the apex with a short stout bristle, the edges remotely glandular-dentate in the upper part ; both surfaces, but especially the lower, sparsely arachnoid-hairy, the edge on the lower surface densely so : main nerves of leaflets about 4 pairs, spreading ; length 2 to 3 in., breadth ·6 to 1·25 in. ; petiole about 1 in. ; petiolules about ·35 in. ; those of the lower leaflets rather shorter. *Inflorescence* glabrous, borne on a short tendril-bearing peduncle. *Flowers* 4-merous. *Fruit* unknown.

Malacca : Griffith, Maingay (Kew Distrib.), No. 432.

This is known only from Griffith's and Maingay's very scanty specimens. It may be only a pedate form of *P. heterantha*.

3. LEEA, Linn.

Small trees, shrubs or herbs. *Branches* striate or sulcate, often herbaceous. *Leaves* alternate, usually very large, simple, or 1–2–3-pinnate ; petiole often dilated at the base, stipules sheathing. *Peduncles* opposite the leaves or sub-terminal. *Tendrils* 0. *Inflorescence* corymbosely-cymose. *Flowers* red yellow or green. *Calyx* 5-toothed. *Petals* 5, connate at the base and adhering to the staminal tube, revolute. *Stamens* united at the base into a 5-lobed tube, the filaments inserted between the lobes of the tube, inflexed ; *anthers* exserted. *Ovary* inserted on the disc, 3- to 8-celled ; *style* short, stigma swollen ; *ovules* 1 or 2 in each cell, erect. *Fruit* 3- to 8-celled, berry-like, usually succulent, depressed-globular and lobed, pulp often scanty. *Pyrenes* wedge-shaped, seeds compressed.—DISTRIB. Species about 50, mostly tropical Asiatic and African, a few Australian.

Leaves simple, or with 3 to 5 large pinnules.

Leaves pubescent beneath, cymes on long peduncles ... ... 1. *L. latifolia*.

Leaves quite glabrous on both surfaces ; cymes on short peduncles.

A tree ; leaflets 5 ... ... 2. *L. grandifolia*.

A shrub 12 to 18 in. high: leaves simple or at most 3-partite, teeth of staminal tube deeply bifid; flowers numerous ... 3. *L. simplicifolia.*

A shrub 12 to 18 in. high: leaves never simple, leaflets 3 to 5, teeth of staminal tube faintly emarginate but not bifid; flowers few ... ... 4. *L. pauciflora.*

Leaves pinnate or bi- or tri-pinnate, leaflets numerous.

Leaflets glabrous on both surfaces.

Buds oblong, cymes 9 to 24 in. across: flowers red ... ... 5. *L. gigantea.*

Buds globular.

Stem and branches thorny ... 6. *L. angulata.*

Unarmed.

Cymes not more than 8 or 9 in. across, spreading, lax, on long peduncles, flowers white... ... 7. *L. Sambucina.*

Cymes only 1·25 to 2·25 in. across, compact, flowers red ... ... 8. *L. acuminata.*

Buds obovoid and on long pedicels; cymes large, lax, divaricating; flowers ·25 in long ... ... 9. *L. Curtisii.*

Leaflets glabrous on both surfaces, main nerves winged and crisped and with lines of minute black hairs along them when young... ... ... 10. *L. rubra.*

Leaflets hairy underneath but without glands.

Cymes on long peduncles, lobes of staminal tube not emarginate ... 11. *L. robusta.*

Cymes on short peduncles, lobes of staminal tube emarginate ... ... 12. *L. javanica.*

Leaflets hairy underneath and with numerous flat discoid glands ... ... 13. *L. aequata.*

1. Leea latifolia, Wall. Cat. 6821. A shrub, young branches rusty furfuraceous-puberulous. *Leaves* simply pinnate, leaflets 3 to 5, oblong to sub-orbicular, sub-acute or obtuse, remotely serrate, the base sub-cordate; upper surface glabrous; the lower paler with some scattered pale hairs on the midrib and 10 to 12 pairs of spreading nerves, the reticulations transverse and very distinct; length 9 to 12 in., breadth 6 to 11 in. *Cymes* on long peduncles, umbellate, with branches

3 to 5 in. long, shortly pubescent. *Lobes* of the staminal tube notched. Kurz For. Flora Burma, I, 278: in Journ. As. Soc. Beng., Vol. 44 pt. II, p. 178; Clarke in Trimen's Journ. Bot. for 1881, p. 138. *L. macrophylla*, Laws. (not of Hornem.) in Hook. fil. Fl. Br. Ind. I, 664. *L. cinerea* and *L. coriacea*, Laws. in. Hook. fil. Fl. Br. Ind. I, 665.

Andaman Islands: King's Collectors.—DISTRIB. Burma.

2 LEEA GRANDIFOLIA, Kurz in Trimen's Journ. Bot. 1875, p. 325. A small tree 10 to 20 feet high: young branches lenticellate, glabrous, sparsely verrucose. *Leaves* glabrous, simply pinnate; *leaflets* 5, broadly ovate to oblong-ovate, shortly acuminate, the edges with large shallow crenations or sub-entire; the base broad, rounded: main nerves 8 to 10 pairs, spreading, much curved at the tips; both surfaces glabrous, the reticulations not prominent: length 9 to 12 in., breadth 4 to 5 in.; petiolules of the terminal leaflet 2 in., of the laterals ·5 to ·75 in. *Cymes* about 4 in. across, on peduncles only about 1 in. long, trichotomously umbellate, the branches about 1 in. long, almost glabrous. *Flowers* greenish white; *lobes* of staminal tube emarginate. *Fruit* sub-globular, depressed, lead-coloured when ripe.

Nicobar Islands: Jelinek; Katchal, Kurz: Bati Malv, Prain.

This differs from *L. latifolia* in having verruculose branches, perfectly glabrous obscurely reticulate leaves, and small very shortly pedunculate cymes.

3. LEEA SIMPLICIFOLIA, Zoll. in Natur en Geneesk. Arch. II, 577. An unbranched shrub 12 to 18 in. high; *stem* glabrous, sparsely lenticellate. *Leaves* simple or ternate: the *simple* broadly elliptic, somewhat obovate, shortly and abruptly acuminate, the edges sinuate-serrate or sub-entire, the base narrowed and sometimes minutely cordate; both surfaces glabrous, the lower bright brown when dry and with the reticulations very distinct; main nerves 9 to 12 pairs, spreading, rather straight; length of the simple leaves 4·5 to 9 or 12 in., breadth 2·5 to 6·5 in., petiole ·75 to 2 in.: the *pinnate* leaves with the lateral leaflets narrowly elliptic and sub-oblique, 8 to 10 in. long, and about 3 in. wide, the terminal larger, petiolules about ·3 in. long; the terminal leaflet like the simple and with a petiolule 1·5 in. long. *Cymes* capitate, dense, about ·75 in. in diam. on peduncles ·5 in. or less in length. *Flowers* numerous, crowded, white: the *lobes* of the staminal tube with 2 broad deep teeth. *Fruit* sub-globular, ·3 or ·4 in. in diam., glabrous, dark-coloured and pulpy when ripe. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 612; Ann. Mus. Lugd. Bat. I, 101; C. B. Clarke in Trim. Journ. Bot. for 1881, p. 166.

Perak: Scortechini, No. 1206; King's Collector, No. 2195.—DISTRIB. Sumatra.

4. Leea pauciflora, King n. sp. A shrub 12 to 15 in. high; the *stems* slender, glabrous, sparsely lenticellate. *Leaves* pinnate, the rachises and petioles sub-terete; *leaflets* 3 to 5, oblong to elliptic-oblong, the terminal one larger and broader than the lateral, all with short rather blunt acuminate apex, the edges with a few remote shallow serrations or sometimes almost entire, the laterals slightly oblique towards the rounded or cuneate base: both surfaces glabrous and shining, the reticulations very distinct on the lower when dry: main nerves 6 to 8 pairs, faint, spreading: length of the lateral leaflets 2·5 to 4·5 in., breadth 1 to 2·5 in., the terminal one from 4·5 to 6 in. long, and from 2 to 3·5 in. broad: petiolules of the laterals ·2 to ·3 in. long, of the terminal about ·75 in. *Cymes* terminal, capitulate, densely few-flowered, about ·35 in. in diam., on pedicels ·35 in. long. Colour of flowers unknown; lobes of staminal column broad, very slightly emarginate, covered with pale dots. *Fruit* depressed-globular, deeply lobulate, glabrous, about ·4 in. in diam., white when ripe and with little pulp.

Perak: Scortechini, King's Collector, No. 1113.

This is allied to *L. simplicifolia* Zoll., but differs in its leaves which are never simple and which have 3 to 5 leaflets smaller than in the pinnate forms of *L. simplicifolia*. The cymes of this are moreover few-flowered and much smaller than in that species, and the lobes of the staminal column in this are broad and very slightly emarginate or sub-entire; whereas in *L. simplicifolia* they are more deeply bifid than in any species here described. The ripe fruit of this is moreover stated by Kunstler to be white.

5. Leea gigantea, Griff. Notul. IV, 697: Ic. Pl. Asiat. t. 645, fig. 3. A tall shrub or small tree; young branches puberulous, lenticellate. *Leaves* often several feet in length, 3-pinnate, the rachis and petiole sub-terete, not winged: *leaflets* oblong or elliptic-oblong, shortly and abruptly acuminate, coarsely and sharply serrate, the base cuneate; both surfaces glabrous, shining; main nerves 8 to 13 pairs, spreading; the connecting veins numerous, wavy, sub-horizontal, and very prominent on the lower surface; length 5 to 10 in.; breadth 2·25 to 4 in.; petiolules of lateral leaflets ·3 to ·75 in., the terminal two or three times as long. *Cymes* in a lax many-branched spreading panicle from 9 in. to 2 feet across, minutely puberulous or glabrescent. *Flowers* purplish red, the buds oblong; *staminal tube* with acute bifid teeth. *Fruit* depressed-globular, smooth, black when ripe, with scanty pulp, ·25 to ·3 in. diam. *Seeds* flattened, with dorsal ridge, the sides irregularly ribbed. Kurz in Journ. As. Soc. Bengal, Vol. 42, pt. 2, p. 65; Vol. 44, Pt. 2, p. 178; For. Flora Burma, I, 280: C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 140. *L. Sambucina*, Wall. Cat. 6823 B (in part). *L. Staphylea*, Wall. Cat. 6823 K.

Penang: Wallich, Stoliczka, Curtis, King. Johore; King. Perak; King's Collector, Nos. 505, 2494.

The specific name given to this is unfortunate, as it implies that the plant is a large one. As a matter of fact it is a much smaller plant than *L. angulata*, Korth. which often forms a tree 30 feet in height; while this is usually a shrub about 10 feet high. This species has however very much larger leaves and panicles than any other *Leea* known to me. The flowers of this are bluish red: the teeth of the staminal tube I find, contrary to the observations of the late Mr. Kurz and Mr. C. B. Clarke, to be bifid at the apex. My colleague Dr. Prain, to whom I have shown dissections of flowers taken from Wall. Cat. 6823B, (as well as from other specimens) quite agrees with me in this. As Mr. Clarke has remarked in his excellent *Revision of the Indian species of Leea* (Trimen's Journ. Bot. for 1881, p. 100 *et seq.*), the characters of the seeds of this plant have given rise to some discussion. I find them to be as above described. The late Mr. Kurz (in Journ. As. Soc. Beng., Vol. 42, p. 65) described them thus: "*semina obtuse carinata, lateribus tuberculato-costatis*," which is a fairly accurate account of them. In a later number of the same *Journal*, (Vol. 44, p. 178) however, he described them in these words "seeds tubercled-keeled, the edges tubercled-ribbed," which is inaccurate. Mr. Clarke, disregarding Kurz's earlier description, and not finding the seeds of this species to agree with his later description, assumed that Kurz must have had another plant before him, and for this plant Mr. Clarke has proposed the name (Trimen's Journ. *l. c.*) *L. tuberculo-semen*. The very specimens described by Kurz as *L. gigantea*, Griff. are however, in the Calcutta Herbarium, and they bear that name in his own handwriting. These specimens undoubtedly agree with all the sheets of Wall. Cat. 6823B. in the same Herbarium, which Mr. Clarke regards as true *L. gigantea*. The truth probably is that the markings on the sides of the seeds which Kurz described in two ways in the *Journal* of the Asiatic society are *post mortem* appearances—an explanation which is supported by the facts that, in his Flora of Burma, Kurz describes them in still another way as "bluntish-keeled and tubercled-ribbed;" and that nobody's description agrees with Griffith's figure (Ic. Pl. Asiat. t. 645, fig. 3) which was probably drawn from fresh seeds! Dry seeds taken from Herbarium specimens moreover vary in appearance according as they are examined immediately after having been boiled, or after some delay: and this is no doubt the explanation of Kurz's three differing descriptions. The nearest ally of this species is undoubtedly *L. sambucina*, Willd; but that species has much smaller leaves leaflets and panicles, and it has green not red flowers.

6. Leea angulata, Koth, ex Miq. in Ann. Mus. Lugd. Bat. I, 97. A bushy tree 20 to 30 feet high, the stem with many sharp thorns, the branches and lower part of the petioles and peduncles with a few scattered short thorns. *Leaves* about 1 foot long, 2-rarely 3-pinnate: the rachis angled, channelled on the upper surface, and the common petiole dilated at the base: *leaflets* 5, rarely 7, glabrous, narrowly oblong-lanceolate, shortly acuminate, distantly serrate-crenate, the terminal one equal-sided at the base, the laterals oblique, all crenate; main nerves 5 or 6 pairs in the lateral, and 9 to 12 pairs in the terminal leaflet, spreading, slightly prominent on the lower surface but not winged or crisped; length of the laterals 1·5 to 2·5 in., of the terminal 3 to 4·5 in.; breadth ·85 to 1·25 in.; *petiolules* ·1 to ·25 in. *Cymes* on glabrous slightly prickly peduncles 2 to 3·5 in. long, open, branching, measuring 3 in. across, almost glabrous; *bracteoles* minute, lanceolate, in pairs. *Flowers* dull white. *Staminal tube* 5-toothed. *Berries* depressed-globose, black and juicy when ripe, ·35 in. in diam. *L. horrida* Teysm. and Binn. (name only) Cat. Hort. Bot. Bogor. ed. 1866 p. 169. *L. Malayana*, Scortechini MSS. *L. aculeata*, C. B. Clarke (not of Blume) in Trimen's Journ. Bot. for 1881. p. 105.

Perak: Wray, Nos. 3325, 3803; Scortechini, No. 1829; King's Collector, Nos. 1145, 7066. Pahang: Ridley, No. 2583. Nicobar Islands: Kurz, King's Collector.—Distrib. Java.

This differs from *L. aculeata*, Bl. in being a larger plant and in having white, not red, flowers. *L. aculeata* has moreover simply pinnate leaves with about seven leaflets of larger size in this; the rachis in the leaves of that moreover is not winged, nor is the base of the petiole dilated.

7. Leea sambucina, Willd. sp. Pl. I, 1177. A shrub 4 to 10 feet high; young branches deciduously adpressed-rusty-puberulous. *Leaves* 15 to 20 in. long, 2-rarely 3-pinnate, the rachis and petiole not winged: *leaflets* oblong or elliptic, shortly and sharply acuminate, coarsely and sometimes rather unequally serrate, the base slightly cuneate; both surfaces quite glabrous; main nerves 7 to 12 pairs, rather prominent beneath, spreading; veins not prominent, transverse; length 3 to 6 or even 9 in., breadth 1·5 to 3 in; petiolules of the lateral leaflets ·2 to ·4 in., the terminal one two or three times as long. *Cymes* on stout peduncles several inches long, (sometimes 6 in.), spreading, rather lax, almost glabrous, not usually more than 8 or 9 in. across. *Flowers* greenish-white, the buds sub-globular: *staminal tube* yellowish-white, its lobes notched. *Fruit* depressed-globular, smooth, black, pulp scanty, ·3 in. in diam. Roxb. Hort. Beng. 18; Fl. Ind. ed. Carey II, 470; DC. Prodr. I, 633; Wall. Cat. 6823, A, C, and part of B; Blume Bijd.

196; Griff. Notul. IV, 698; Ic. Pl. Asiat. t. 644, fig. 1, t. 645, figs. 6, 8; Decne in Ann. Mis. d' Hist. Nat. III, 445; Miq. Fl. Ind. Bat. I, pt. 2, 611; in Ann. Mus. Lugd. Bat. I, 98, (*only in part, and perhaps not at all*); Laws. in Fl. Brit. Ind. I, 666 (*partly*); Brand. For. Fl. 102; Kurz in Journ. As. Soc. 44, II, 179; For. Fl. Burma I, 279; (*not of Benth. nor of Baker.*); C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 139. *L. Staphylea*, Roxb. Hort. Beng. 18; Fl. Ind. ed. Carey II, 471; Wall. Cat. 6824, F. I.; W. and A. Prodr. 132; Wight Ic. t. 78; Dalz. and Gibs. Bomb. Fl. 41; Thwaites Enum. Pl. Zeyl. 64. *L. Ottilis*, DC., Prodr. I, 636. *Leea viridiflora*, Planch. Hort. Donat. 6. *Aquilicia Sambucina*, Linn. Mant. 211; Cav. Dissert. VII, t. 218. *Staphylea indica*, Burm. Fl. Ind. 75, t. 24, fig. 2. *Aquilicia Ottilis*, Gaertn. Fruct. I, 275. *Ottilis zeylanica*, Gaertn. Fruct. t. 57. *Gastonia Naluga*, Lamk. Dict. II, t. 611. *Gilibertia Naluga*, DC. Prodr. IV, 256. Rumph. Herb. Amb. IV, t. 45. Rheede Hort. Mal. II, t. 26.

Penang: Wallich, Curtis. Singapore: Hullett. Malacca: Maingay (Kew Distrib.), No. 433. Andaman Islands: very common.—DISTRIB. British India.

This species is rare in the Malayan Peninsula, but very common in the Andamans. It forms a bush of about the same size as *L. gigantea*, Griff., from which it is readily distinguished by its smaller leaves and panicles and by its green flowers. I have followed Mr. C. B. Clarke implicitly as to the synonymy of this species as given in his excellent paper in Trimen's Journal of Botany.

Var. *biserrata*, Miq. Ann. Mus. Lugd. Bat. I, 99. Serrations of the leaves very unequal, sometimes alternately large and small. *L. biserrata*, Miq. Fl. Ind. Bat. Suppl. 518.

Perak: King's Collector, No. 3282. Singapore: Ridley, No. 4746. DISTRIB. Bangka.

8. LEEA ACUMINATA, Wall. Cat. 6830. An under-shrub 2 to 3 feet high; young branches glabrous. *Leaves* usually pinnate, but one of the lower pinnae often pinnulate; the *rachis* not winged, the petiole very slightly dilated at the base; *leaflets* oblong, rarely ovate-oblong, sharply acuminate, slightly and unequally serrate, the base rounded or slightly cuneate: both surfaces glabrous, sometimes dotted; main nerves 10 to 12 pairs, rather prominent beneath, the veins sub-horizontal: length 2·5 to 8 in., breadth ·75 to 2 in. *Cymes* compact, 1·25 to 2·25 in. across, many-flowered, the branches short, minutely rusty-pubescent, on peduncles varying from 1 to 3 in. long. *Flowers* coral-red, sub-globular, bracts and bracteoles usually absent; *lobes* of the staminal tube broad, emarginate. *Fruit* depressed-globular, red when ripe, ·25 in. in diam. C. B. Clarke in Trimen's Journ. Bot. for 1881, 102. *L. sambucina*, Laws.

(not of Willd.) in Hook. fil. Fl. Br. Ind. I, 666 (in part). *L. lacta*, Wall. Cat. 6831 A and B; Kurz in Journ. As. Soc. Beng., Vol. 42, pt. 2, p. 65; Vol. 44, pt. 2, p. 179: For. Flora Burma, I, 278; C. B. Clarke *l. c.*, p. 103. *L. sanguinea*, Wall. Cat. 6824.

Andaman Islands: common.—DISTRIB. Along the base of the Eastern Himalaya, the Assam Range and Burma.

I cannot see how Wallich's two sets of specimens named *L. acuminata* and *L. laeta* are to be distinguished as species—the solitary difference which I can find between them being that, in *L. laeta* the cymes are more condensed and have shorter peduncles than in *L. acuminata*. I have therefore, in spite of the high authority of Mr. C. B. Clarke who keeps them distinct, ventured to unite them. The species, as I understand it, is allied to *L. sambucina*, Willd., but is a much smaller plant and has coral-red, not green, flowers in rusty-pubescent condensed cymes, and red fruit.

9. LEEA CURTISII, King n. sp. An erect shrub 4 to 5 feet high: young shoots deciduously puberulous. *Leaves* 2·5 to 3 feet long, bipinnate, the rachises channelled, the petiole terete; *leaflets* elliptic or oblong-elliptic, shortly caudate-acuminate, remotely crenate, the bases cuneate; both surfaces glabrous, the lower transversely reticulate; main nerves 5 or 6 pairs, curved, sub-ascending, prominent on the lower surface; length 3·5 to 4·5 in., breadth 1·5 to 2 in.: *petiolules* of the lateral leaflets about ·3 in., of the terminal 1·5 in. *Cymes* on a long stout peduncle, umbellate, branched; the branches lax, spreading, few-flowered. *Flowers* large, obovoid, in pairs with deciduous bracteoles at the base. *Calyx* glandular-hairy, pure white, its lobes spreading, *Petals* reflexed, whitish-yellow, teeth of staminal tube entire. *Fruit* unknown.

Perak: on Waterloo Peak, alt. 1500 feet; Curtis. No. 2872.

Collected only by Mr. Curtis who describes the young leaflets as beautifully marked with silvery-grey variegations along both sides of their midribs. This appears in its foliage to resemble the imperfectly known Bornean species *L. amabilis*, the leaflets of which, however, have more nerves and more serrations.

10. LEEA RUBRA, Blume Bijdr. 197. A shrub 1 to 6 feet high; young branches minutely scaly-pubescent, ultimately glabrous. *Leaves* 2- to 3-pinnate, the main rachis angled and sometimes slightly winged: *leaflets* 3 to 5, ovate to ovate-oblong, shortly acuminate, coarsely serrate, rounded or sub-cuneate at the base, sub-sessile; main nerves 6 to 10 pairs, winged and crisped and, in young leaves, with minute black hair along their sides, otherwise glabrous on both surfaces. *Cymes* on peduncles ·5 to 2·5 in. long, furfuraceous rusty-puberulous, condensed

but much branched, 2 to 3 in. in diam., bracts and bracteoles absent. *Flowers* red. *Lobes of* the staminal tube notched. *Berries* ·25 in. in diam. Dene. in Ann. Mus. d'Hist. Nat. III, 445; Hassk. Pl. Jav. Rar. 453; Miq. Fl. Ind. Bat. I, pt. 11, 610; Ann. Mus. Lugd. Bat. I, 96; Kurz in Journ. As. Soc. Beng., Vol. 44, II, 180; For. Flora Burma, I, 279; C. B. Clarke Journ. Bot. for 1881, p. 104. *L. sanguinea*, Kurz in Journ. As. Soc., Vol. 42, II, 66? *L. coccinea*, Kurz (not of Planch.). ? *L. polyphylla*, Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 610.

Singapore: Ridley, No 1928. Pahang: Ridley, No. 2133. Penang: Curtis, No. 1107. Quedah: King's Collector, No. 1716; Curtis, Nos. 2601 and 2645.—Distrib. Burma, Eastern Bengal.

This, as his specimen in Herb. Calcutta shows, is what Kurz referred to *L. coccinea*, Planch. (For. Flora Burma, I, 278.)

11. Leea robusta, Roxb. Hort. Beng. 18; Fl. Ind. ed. Carey II, 468; ed. 1832 II, 655. A shrub 5 or 6 feet high: young branches with coarse rusty deciduous pubescence. *Leaves* from pinnate to tripinnate, the rachis and petioles angled, minutely lepidote, not winged or dilated; *leaflets* oblong or elliptic-oblong, acuminate, remotely and unequally serrate (sometimes obsoletely serrate); the lower broad and rounded at the base, the terminal one cuneate: main nerves 8 to 12 pairs, ascending, the connecting veins faint; upper surface sparsely strigose; the lower shortly pubescent, eglandular, the nerves sparsely strigose. *Cymes* on long peduncles, sparsely umbellate, minutely tomentose; *bracteoles* linear, deciduous. *Flowers* greenish, lobes of staminal tube grooved outside but not bifid at the apex. *Fruit* depressed-globose, ·25 in. in diam., black when ripe, the pulp very scanty. Wall. Cat. 6826; W. and A. Prod. 132; Kurz in Journ. As. Soc. Beng., Vol. 44, pt. 2, pp. 178, 180; For. Flora Burma, I, 279; C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 164. L. *aspera*, Wall. Cat. (not of Edgew.) 6825. *L. diffusa*, Laws. in Hook. fil. Fl. Br. Ind. I, 667.

Singapore: Ridley, No. 3788. Andaman Islands: King's Collectors.—Distrib. British India.

Roxburgh founded this species on specimens collected in the Northern Circars, but none of his original material is now extant. Specimens collected within recent years by Mr. J. S. Gamble in Ganjam (which is practically Roxburgh's Northern Circars) dry of a very pale colour, and have narrowly oblong leaflets with a few short hairs on the nerves beneath. In shape and colour they are distinguished from Wallich's own specimens of his *L. parallela* from Burma by a single character, which is that the adult leaves of *L. parallela* are quite glabrous beneath. But specimens recently obtained from Wallich's collecting ground in Upper Burma show that the leaflets of *L. parallela* are, when

young, pubescent beneath. As the only distinguishing character thus breaks down, I cannot see how *L. parallela* is to be kept up as a species. After examining with great care a very large suite of Indian Leeas, I cannot see how *L. aspera*, Edgew. and *L. herbacea*, Ham., are to be kept up as more than varieties of *L. robusta*. Mr. Curtis collected in Selangor (Herb. Curtis, No. 2329) specimens without flowers which may belong to this species. The fruit is however larger than in typical *L. robusta* and has the appearance of having been also more pulpy.

12. Leea javanica, Blume Bijd. 197. A large shrub: young branches slightly scaberulous. *Leaves* pinnate, the lower bi-pinnate; the rachises channelled above, not winged; petiole not dilated at the base, all deciduously and minutely tomentose: *leaflets* oblong or elliptic-oblong, shortly acuminate, shortly serrate-dentate, the base rounded: upper surface glabrous, the midrib and nerves puberulous: lower surface rusty-pubescent especially on the nerves, dark-red when dry: main nerves 10 to 12 pairs, spreading, curving, prominent beneath: connecting veins distinct, sub-horizontal; length 3·5 to 10 in., breadth 1·75 to 3 in.; petiolules of the lateral leaflets ·15 to ·25 in., of the terminal 1 in. or more. *Cymes* on rather short peduncles, umbellate, spreading, many-flowered, 3 or 4 in. across, minutely rusty-tomentose; *bracteoles* minute, deciduous. *Flowers* greenish-white; lobes of staminal tube broad, emarginate. *Fruit* depressed-globular, bluish-black when ripe, ·3 in. in diam. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 610: Ann. Mus. Lugd. Bat. I, 100; C. B. Clarke in Trimen's Journ. Bot. for 1881, p. 165.

Perak: King's Collector, Nos. 552 and 8368. Singapore; Schomburgh.—Distrib; Java, Celebes. Sumatra, Forbes, No. 1395.

This is closely allied to *L. sundiaca*, Miq. which however has red flowers. It is also allied to *L. aequata* Linn. and to *L. robusta*, Roxb.

13. Leea aequata, Linn. Mant. 124. A shrub 4 to 10 feet high: young shoots deciduously pubescent, scaberulous. *Leaves* bi-pinnate, the rachis angled and pubescent, not winged, and the base of the petiole not dilated; *leaflets* narrowly oblong, rarely ovate-oblong, sharply acuminate, distantly and rather unequally serrate, the base usually rounded, rarely cuneate but sometimes oblique; upper surface with scattered setae especially on the midrib and nerves, otherwise glabrous; the lower surface setose-pubescent especially on the nerves, and with numerous circular discs; main nerves 7 to 12 pairs, spreading, ascending, curved; connecting veins horizontal, distinct; length 3 to 7 in., breadth 1 to 1·75 in.; petiolules of the lateral leaflets ·15 to ·3 in., of the terminal about 1 in. *Cymes* sessile or on peduncles up to 1·5 in. long, tomentose; bracts broad, caducous. *Flowers* white, teeth of staminal tube bifid. *Fruit* depressed-globular, black when ripe, pulp

scanty, ·25 in. in diam. Miq. in Ann. Mus. Lugd. Bat. I, 98: Kurz in Journ. As. Soc. Beng. Vol. 44, pt. 2, pp. 178, 180; Flora Burma I, 281; C. B. Clarke in Trimen's Journ. Bot. for 1881, 163. *L. hirta*, Hornem. Hort. Hafn. I, 237: Roxb. Fl. Ind. ed. Carey II, 469: ed. 1832, II, 656; Blume Bijdr. 197; Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 612; Wall. Cat. 6822; Dene in Ann. Mus. d'Hist. Nat. III, 446; Miq. Fl. Ind. Bat. I,, pt. 2, p. 612; Lawson in Hook. fil. Fl. Br. Ind. I, 668. *L. hirsuta*, Bl. Bijdr.; Miq. Fl. Ind. Bat. I, pt. 2, p. 612.

Perak: Scortechini, King's Collector, No. 4387. Quedah: King's Collector, No. 1725. Andaman Islands: Kurz, King's Collector.—Distrib. Java, Sumatra.

This species is, as Mr. C. B. Clarke has well pointed out, at once recognisable by the curious glandular discs on the under surface of the leaf—a character found in no other species of the genus.

Order XXXIV. Sapindaceæ.

Trees, shrubs, or rarely climbing herbs. *Leaves* alternate, rarely opposite, exstipulate or occasionally stipulate, pinnate, palmate-trifoliolate or simple; *leaflets* opposite or alternate, entire or dentate, rarely lobed. *Flowers* mostly polygamo-dioecious and small, usually either irregular or unsymmetrical. *Calyx* mostly 4–5-lobed, or with 4–5 sepals; sepals or lobes often unequal, imbricate or valvate in the bud. *Petals* free, equal or unequal, usually 4–5 or 0, often bearded or squamate at the base within. *Disc* annular or unilateral, rarely (in ♂ flowers) deficient. *Stamens* 5–10, inserted inside the disc at the base of the ovary or outside or on the disc, sometimes unilateral; *anthers* 2-celled, basifixed or versatile; *filaments* often pubescent, almost always free. *Ovary* centric or excentric, entire or lobed, or sometimes divided nearly to the base, 1–3-celled. *Style* simple or divided, usually terminal; *stigma* usually simple. *Ovules* usually 1 rarely 2 or more in each cell, affixed to the axis of the ovary, ascending. *Fruit* capsular or indehiscent, entire or lobed, sometimes winged. *Seeds* globose or compressed, arillate or naked, exalbuminous, rarely albuminous. *Embryo* usually thick, sometimes plicate or spirally convolute.—Distrib. About 550 to 800 species scattered over the whole world.

Ovules solitary in each loculus of the ovary.

Leaves trifoliolate; inner cotyledon transversely bi-plicate; disc unsymmetrical.

Scandent tendril-bearing herbs or shrubs with 3-foliolate leaves; petals with cucullate crested scales; fruit a membranous 3-celled capsule ... ... 1. CARDIOSPERMUM.

Erect shrubs or trees without tendrils; leaves 1- to 3-foliolate; scales of petals emarginate; fruit (by abortion) with 2 or 1 globose indehiscent baccate cocci ... 2. ALLOPHYLUS.

Leaves (except in *Paranephelium*) equally pinnate (simple in one *Aphania*); cotyledons curved or sub-circinate, rarely sub-diplicolobate; disc symmetrical or unsymmetrical.

Fruit indehiscent.

Seeds without arillus.

Fruit 1- to 3-coccous, two of the segments small and imperfect or obsolete, the developed one sub-globose and fleshy, testa of seed bony; sepals and petals oblong, the basal scales of the petals entire 3. DITTELASMA.

Fruit 1- to 3-lobed to the base, the lobes diverging, oblong; the testa of the seed membranous; sepals orbicular; petals obovate, their basal scale lobed ... 4. ERIGOLOSSUM.

Fruit deeply divided into 2 rarely 3 ellipsoid or sub-3-gonous divergent lobes united only at their bases; sepals more or less orbicular; petals smaller with 2 infolded basal auricles or with 2 basal scales 5. APHANIA.

Fruit sulcate, never lobed: inflorescence often from the branches.

Fruit sub-ligneous, 3-celled, 3-angled; flowers symmetrical, scales of petals crested: lower pinnules of leaves not stipule-like ... ... 6. LEPISANTHES.

Fruit baccate, fleshy, incompletely septate; scales of petals not crested; lower pinnules of leaves stipule-like ... ... 7. OTOPHORA.

Seeds arillate.

Fruit coccate or deeply sulcate, arillus adnate to the testa with a free edge round the micropyle.

Micropyle near the hilum; calyx-lobes 4 to 5, petaloid, concave, broadly imbricate; fruit muricated ... ... 8. XEROSPERMUM.

Micropyle remote from the hilum: calyx lobes small, valvate, petals sometimes 0; fruit muricated or tubercled or obsoletely so ... ... 9. NEPHELIUM.

Micropyle intermediate between the base and apex of the seed; lower leaflets stipule-like; fruit quite smooth ... ... 10. POMETIA.

Fruit dehiscent, often produced into false wings; seeds usually arillate.

Calyx polysepalous, imbricate in two series, buds sub-globose; petals with 2 crested basal scales; fruit 3-winged or 3-lobed, arillus caudate ... ... 11. GUIOA.

Calyx gamosepalous, dentate or lobed; petals with two crested basal scales; fruit large, pyriform, with thick pericarp, obtusely 3-angled, not lobed ... 12. TRIGONACHRAS.

Petals with 2 crestless basal scales, or sometimes absent; fruit with the cocci quite distinct and divaricate; disc sub-entire, annular.

Arillus enclosing the whole or nearly the whole of the seed, not appendiculate at the base ... 13. ARYTERA.

Arillus with 2 spur-like processes at its base; fruit pyriform or globose, 3-lobed ... ... 14. MISCHOCARPUS.

Petals peltate-infundibuliform, the single large basal scale being connate with each petal by its edges.

Ovary 2-celled; fruit obovate, the pericarp coriaceous, the arillus fleshy, basal; the leaves equally pinnate, flower buds oval, pointed .. ... 15. LEPIDOPETALUM.

Ovary 3-celled; fruit with the pericarp woody, tuberculur or echinate: flower-buds sub-globose ... 16. PARANEPHELIUM.

Ovules 2 or more in each loculus of the ovary.

Leaves simple, exstipulate: stamens inserted outside the disc; the capsule much compressed, membranous, winged, seeds ex-arillate ... ... 17. DODONAEA.

Leaves pinnate, exstipulate; stamens inserted inside the disc; capsule coriaceous, inflated, sub-compressed, reniform, 2-celled, not winged; seeds arillate ... ... 18. HARPULLIA.

Leaves pinnate, stipulate; stamens inserted outside the lobed disc; fruit more or less fleshy, sub-globose, 3-celled, indehiscent; seeds without arillus ... ... 19. TURPINIA.

1. CARDIOSPERMUM, Linn.

Climbing tendril-bearing herbs with alternate exstipulate leaves, biternate coarsely dentate leaflets, axillary racemes, and irregular polygamo-dioecious flowers. *Sepals* 4, imbricate, concave, the 2 outer small. *Petals* 4, in pairs, the larger two with a scale above the base; the two smaller inferior, remote from the stamens, each furnished with a small crested scale. *Disc* unilateral, undulate, almost reduced to 2 round or linear glands opposite the lower petals. *Stamens* 8, excentric; filaments free or connate at base; the 4 nearest to the glands shorter than the rest. *Ovary* sessile or sub-sessile, 3-celled; *style* short, trifid; *ovules* solitary, ascending. *Capsule* membranous, 3-celled, 3-valved, inflated, loculicidal. *Seeds* globose, usually arillate at the base, exalbuminous, testa crustaceous; *cotyledons* large, transversely conduplicate.—DISTRIB. About 30 species, mostly Tropical American and Tropical African.

CARDIOSPERMUM HALICACABUM, Linn. Sp. Pl. ed. I, 366. Annual or perennial; the branches slender, striate, sparsely pubescent or subglabrous. *Leaflets* deltoid, acuminate, deeply and sharply lobed,

glabrous or sparsely pubescent. *Flowers* white, ·15 in. long. *Capsule* globose or pyriform, much inflated, veined, ·75 to 1·25 in. broad. W. & A. Prodr. I, 109; Wall. Cat. 8030; Griff. Notul. IV, 546; Ic. Pl. Asiat. IV, t. 599, f. 3; Dalz. & Gibs. Bomb. Fl. 34; Wight Ic. t. 508; Thwaites Enum. 54; Roxb. Fl. Ind. II, 292; Bot. Mag. t. 1049; Grah. Cat. Bomb. Pl. 28; Boiss. Fl. Orient. I, 945; Benth. Fl. Austral. I, 453; Hiern in Hook. fil. Fl. Br. Ind. I, 670. *C. microcarpum*, H. B K. Nov. Gen. & Sp. Pl. V, 104; Baker *l. c.* 418, with syn.—Rheede Hort. Mal. VIII, V, 28; Rumph. Herb. Amboin. VI, t. 24, f. 2.

In all the provinces, but usually only near settlements. Distrib. British India, Ceylon, and most tropical countries.

A form of this with rather small and ob-deltoid capsules has been kept up as a species by some authors under the name *C. microcarpum*, H. B. K.; but, as there are innumerable gradations from the globular capsule besides much difference in size, I do not consider that it deserves even varietal rank. The allied species *C. canescens*, Wall. grows in the south of India and in Burmah along with this, but is always distinguishable by its more bluntly lobed leaflets canescent beneath.

2. Allophylus, Linn.

Erect shrubs or trees. *Leaves* alternate, exstipulate, 1- to 3-foliolate. *Racemes* simple or branched, axillary. *Flowers* irregular, small, polygamo dicœcious, globose, sub-sessile. *Sepals* 4, in pairs, much imbricate, concave, unequal. *Petals* 4, small, glabrous, with a villous emarginate scale above the claw. *Disc* one-sided, with a gland opposite each petal. *Stamens* 8, inserted inside the disc. *Ovary* 2-lobed, with 2 cells and a solitary ovule in each. *Style* stout, stigma 2–3-lobed. *Fruit* bi-coccous (usually one suppressed), ovoid, epicarp dry and coriaceous. *Seed* with a small fleshy arillus, *embryo* curved. *cotyledons* plicate. Distrib :—about twenty-five species all tropical and mostly American.

Allophylus Cobbe, Blume Rumphia III, 131. A small tree or shrub; young branches glabrous to tomentose. *Leaves* 3-foliolate; *leaflets* ovate-lanceolate to elliptic-ovate, acute or acuminate, remotely serrate or almost entire, rarely crenate, the base cuneate often oblique and always entire: upper surface glabrous to sparsely pubescent, the lower glaberulous to tomentose; length 1 to 10 in., breadth ·5 to 4 in.; lateral petiolules ·2 to ·3 in., the central twice as long or longer. *Inflorescence* 3 to 9 in. long; the *flowers* small, yellowish or whitish, on short pedicels. *Fruit* globose, ·25 in. in diam., red, shining. Hiern in Hook. fil. Fl. Br. Ind. I, 673; Kurz For. Flora, Burma, I, 299. *Rhus Cobbe*, Linn. Sp. Pl. ed. I, 267. *Ornitrophe Cobbe*, Willd. Sp Pl., II, 322; Roxb. Fl. Ind. II, 268. *Usubis*

triphylla, Burm. Fl. Ind. 89, t. 32, f. 1. *O. Schmidelia*, Pers. Syn. I, 412. *Schmidelia Kobbe*, Lamk. Ill. II, 443, t. 312, f. 2. *S. Cobbe*, DC. Prodr. I, 610; W. and A. Prodr. 109; Grah. Cat. Bomb. Pl 29; Wight Ill. I, 141; Wight Ic. t. 964; Thwaites Enum. 55. *Toxicodendrum Cobbe*, Gærtn. Fruct. I, 207, t. 44, f. 5. *O. errata*, Roxb. Cor. Pl. I, t. 61; Fl. Ind. II, 266. *O. serrata*, DC. *l. c.*; Wight Ill. I, 141; W. and A. Prodr. 110; Benth. Fl. Austral. I, 455; Wall. Cat. 8061 (*O. Malabarica*, Hb. Madr.). *S. racemosa*, Linn. Mant. 67; Wall. Cat. 8059. *O. Aporetica*, Roxb. Hort. Beng. 28; Fl. Ind. II, 264. *Aporetica ternata*, J. R. and G. Forst. Charact. Gen. Pl. 132, t. 66. *O. villosa*, Roxb. Hort. Beng. 28; Fl. Ind. *l.c.* 265. *S. villosa*, Wight Ic. t. 401; Thwaites, *l c*; Wall. Cat. 8060. *S. Rheedii*, Wight Ic. t. 964; Spic. Neilgh. Bot. 33. *O. glabra*, Roxb. Hort. Beng. 28; Fl. Ind. *l. c.* 267. *Allophyllus lanatus*, Roxb. Hort. Beng. 88; Fl. Ind. II, 263. *S. distachya*, DC. l.c. 610. *S. Aporetica*, Wall. Cat. 8058; Kurz in Journ. As. Soc. Beng. 1870, II, 74. *S. glabra*, Wall. Cat. 8057; Steud. Nom. ed. 2, II, 531. *Pometia ternata*, G. Forst. Fl. Ins. Austr. Prodr. 74 (1786). ? *S. dentata*, Wall. ex Voigt Hort. Sub. Calc. 93. *Schmidelia* (*Allophyllus*) *ornitrophioides*, Herb. Roxb.; Wall. Cat. 8055. *S. adenophylla*, Wall. Cat. 8063. *S. vestita*, Wall. Cat. 8066. *S. timorensis*, DC. Prodr. I, 611. *S. orientalis*, Sw. Fl. Ind. Occ. II, 666. *S. ternata*, Cambess. in Mém. Mus. Par. XVIII, 24. *O. asiatica*, Hort. ex Steud. Nom. ed. 2, II, 230.—Rheede, Hort. Mal. V, t. 25.

In all the Provinces.—DISTRIB. British India, the Malayan Archipelago.

A widely distributed and, within certain limits, a variable species to which a variety of names have been given. The synonymy has been most carefully gone into by Mr. Hiern, whose summary of it I have copied bodily from the Flora of British India.

Mr. Hiern has prepared the following table of varieties, which I also copy.

"Leaflets oval or ovate.

Glabrescent or somewhat hairy.

Leaflets crenate-dentate. Bracts short ... ... *racemosa.*

Leaflets serrate-denticulate. Bracts subulate ... *serrata.*

Shoots and leaves very hairy ... ... *villosa.*

Leaflets oval-oblong or lanceolate-acuminate.

Leaflets subentire or serrulate. Bracts short ... *glabra.*

Leaflets acutely serrate. Bracts long, linear ... *Aporetica.*

Racemes simple, 2 together. Petals not declinate, but the place of the fifth petal vacant ... *distachya.*

Racemes branched, solitary ... ... *Rheedii.*"

3. Dittelasma, Hook. fil.

A tree. *Leaves* alternate, pinnate, exstipulate; *leaflets* subopposite or alternate, entire. *Panicles* terminal, bracteate. *Flowers* polygamo-monœcious. *Sepals* 5, oblong, rounded at the apex, unequal. *Petals* 4, erect, oblong, concave, tomentose outside, the place of the fifth vacant; *scale* large obovate-oblong, densely shaggy-crested, incurved at the apex. *Disc* semilunate-annular, much wider at one side, glabrous. *Stamens* 8, inserted around the base of the ovary, unequal; *filaments* villous, slender at the tip; *anthers* small, shortly exserted. *Ovary* sub-globose, glabrous, 3-lobed, 3-celled, contracted at the apex into a short erect style, stigma shortly 3-lobed; *ovule* solitary in each cell. *Fruit* 1–3-coccous, 2 segments usually smaller or obsolete, rather fleshy, indehiscent. *Seed* globose, exarillate, exalbuminous; testa thick, bony; embryo curved; *cotyledons* large, unequal, incurved; *radicle* short, incumbent.—Distrib. A single species.

Dittelasma Rarak, Hook. fil. in Benth. and Hook. fil. Gen. Plantar. I, 396. A tree 50 or 60 feet high; young branches stout, with pale puberulous bark. *Leaves* 10 to 18 in. long; *leaflets* 6 to 12 pairs, usually oblong-lanceolate, rarely oblong-oblanceolate, often slightly oblique, the apex acute, the base cuneate, quite glabrous; main nerves numerous, faint; length 3 to 4 in., breadth ·75 to 1·5 in., petiolule ·1 in. or less. *Panicles* terminal, erect, many-branched, puberulous, usually shorter than the leaves. *Flowers* ·2 in. long, pale yellow or white. Hiern in Hook. fil. Fl. Br. Ind. I, 672; Kurz For. Flora Burma, I, 297. *Sapindus Rarak*, DC. Prodr. I, 608; Blume Rumph. III. 93, t. 197. ? *S. pinnatus*, Mill. Gard. Dict. No. 3. *S. saponaria*, Lour. Fl. Cochinch. 238 (not of Linn.)—Rumph. Herb. Amboin. II, 134.

Malacca: Griffith, Maingay.—Distrib. Burma, Cochin-China, Java.

4. Erioglossum, Blume.

Trees or shrubs. *Leaves* unequally-pinnate, exstipulate, alternate. *Leaflets* opposite or subopposite, entire. *Panicles* terminal, erect, with elongated racemose branches. *Flowers* polygamo-dioecious, irregular, white. *Sepals* 5, unequal, orbicular, concave, imbricated, the two outer ones smaller. *Petals* 4, unequal, obovate, clawed, the place of the 5th vacant; scale hairy, hooded, with an apical lobed appendage. *Disc* one-sided, lobed. *Stamens* 8, turned to one side; *filaments* unequal, hairy, anthers sub-exserted. *Ovary* stipitate, obcordate, 3-lobed, 3-celled; *style* slender, stigma obscurely 3-lobed: *ovules* solitary in the cells of the ovary, ascending. *Fruit* 1–3 lobed to the base; the lobes oblong, indehiscent, diverging. *Seeds* oblong, exarillate, exalbuminous, testa mem-

branous; *embryo* straight; *cotyledons* thick.—DISTRIB. Species 4, three tropical Asiatic and one African.

ERIOGLOSSUM EDULE, Blume Bijdr. 229. A large shrub or tree; young shoots petioles and rachises of leaves and inflorescence more or less rusty-pubescent. *Leaves* 8 to 20 in. long; *leaflets* 4 to 13, oblong-lanceolate to elliptic, acute or acuminate, slightly oblique especially at the cuneate base, upper surface sparsely puberulous to glabrescent, the midrib tomentose; the lower softly tomentose to glaberulous and usually dark-coloured; main nerves 6 to 10 pairs, length 2·5 to 7 in., breadth ·75 to 2·25 in. *Panicles* sometimes longer than the leaves. *Flowers* on short pedicels, clustered, sub-globular, ·1 to ·15 in. in diam. *Fruit* glabrous, the lobes oblong, ·4 in. long. Benth. Fl. Austral. I, 454; Hiern in Hook. fil. Fl. Br. Ind. I, 672. *E. rubiginosum*, Braud. For. Fl. 108. *Pancovia rubiginosa*, Baill. Kurz For. Flora Burma, I, 296. *Moulinsia cupanioides*, Cambess. in Mém. Mus. Par. XVIII. 27, 40, t. 2. *Sapindus rubiginosa*, Roxb. Cor. Pl. I, 44, t. 62; Fl. Ind. II, 282; W. and A. Prodr. I, 112; Grah. Cat. Bomb. Pl. 29; Wall. Cat. 8041; Griff. Notul. IV, 548; Dalz. and Gibs. Bomb. Fl. Suppl. 14; Wall. Cat. 8041D. *S. fraxinifolius*, DC. Prodr. I, 603. *M. rubiginosa*, G. Don Gen. Syst. I, 667. *S. longifolius*, Wall. Cat. 8046.

In all the Provinces: rather common.

5. APHANIA, Blume.

Trees or shrubs with pinnate (usually equally) exstipulate rarely with simple leaves; *leaflets* 1 to 6 pairs. *Flowers* in panicles or racemes. *Sepals* 4 or 5, widely imbricate. *Petals* 4 to 6, small, with infolded basal auricles or with a basal scale. *Disc* regular, slightly lobed. *Stamens* 5, rarely 3. *Fruit* deeply divided into 2 (rarely into 3) ellipsoid or sub-3-gonous divergent lobes united only at the base; the endocarp thin cartilaginous or crustaceous.—DISTRIB. about 12 species, tropical Asiatic and African, one in New Guinea.

Leaves pinnate.

Inflorescence racemose	1.	*A. paucijuga.*
Inflorescence paniculate	2.	*A. montana.*
Leaves simple	3.	*A. Dauura.*

1. APHANIA PAUCIJUGA, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX, (1878), 239. A tree 60 feet high; young branches cinereous-puberulous or glabrous. *Leaves* 5 to 8 in. long, their rachises with 3 faint ridges on the upper surface: *leaflets* 2 to 4, opposite, oblong-lanceolate or elliptic-lanceolate, bluntly acuminate, much narrowed at the base; both surfaces quite glabrous, the upper shining, the lower paler and dull; main nerves 6 to 8 pairs, spreading, not conspicuous:

length 3·5 to 8·5 in., breadth 1·2 to 3 in., petiolules ·2 in. *Racemes* solitary or in pairs, axillary, usually longer than the leaves, slender, adpressed-puberulous, sparsely flowered: *pedicels* slender, bracteoles minute. *Flowers* globular before expansion, ·15 in. in diam. *Sepals* 5, red, orbicular, slightly concave, much imbricate. *Petals* smaller than the sepals, the edges infolded at the base so as to simulate 2 scales, sometimes absent. *Stamens* 8, inserted inside the pentagonous disc; *filaments* hairy at the base; *anthers* short, ovate, obtuse. *Ovary* stalked, compressed, broadly ovate, with short glabrous cub-connate styles, 2-celled. *Fruit* deeply 2-lobed; the *lobes* divergent, obovate, each ·35 in. long, style persistent between the bases of the lobes. *Otophora paucijuga*, Hiern in Hook. fil. Fl. Br. Ind. I, 680.

Malacca: Maingay, No. 462. Perak: Scortechini, No. 1674.

The leaflets in Scortechini's specimens are rather larger than in Maingay's; in other respects they agree.

2. Aphania montana, Blume Bijdr. 236. A shrub; young branches glabrous, minutely lenticellate. *Leaves* 6 to 12 in. long, unequally pinnate: *leaflets* 3 to 5, elliptic to oblong, sub-acute, the base cuneate, both surfaces glabrous and minutely reticulate; main nerves 8 to 10 pairs; length 4·5 to 6 in., breadth 1·75 to 3 in., petiolules ·25 in. *Panicles* axillary, 4 to 9 in. long, solitary or in fascicles of 2 or 3, each with a few lax raceme-like branches, rusty-puberulous. *Flowers* about ·25 in. in diam. *Sepals* 4, in decussate pairs, ovate-rotund. *Petals* 4, ovate, glabrous, the edges fimbriate like those of the sepals; each with a short fimbriate basal scale. *Disc* fleshy, lobed, sub-pubescent. *Stamens* 8, with short thick pubescent filaments inserted inside the disc: *anthers* ovate, slightly sagittate. *Ovary* 2-celled; *style* short, glabrous. *Fruit* 1- usually 2-coccous, fleshy, glabrous: the cocci divaricate, ellipsoid, about ·5 in. long. *Sapindus montanus*, Blume Rumphia, 197: Miq. Fl. Ind. Bat. I, pt. 2. p. 552.

Nicobar and Andaman Islands: King's Collectors. Nicobars: Jelinek.

3. Aphania Danura, Radlk. über die Sapind. Holländ-Indiens, 69. A shrub, all parts except the inflorescence glabrous. *Leaves* simple, sub-verticellate or alternate, sub-coriaceous, oblong, elliptic, oblanceolate or obovate, acute or acuminate, narrowed to the sometimes cordate base: both surfaces reticulate and shining; main nerves 10 to 16 pairs, faint, spreading; length 8 to 12 in., breadth 1·5 to 3·5 in.; petiole ·3 in. to ·1 in., stout. *Panicle* terminal, on a long peduncle, puberulous; the branches spreading, divergent. *Flowers* numerous, pink, bracts minute. *Sepals* 9, unequal, sub-rotund, concave. *Petals* 5, equal, ovate, emarginate, each with a bifid woolly scale at its base. *Disc* annular. *Stamens*

6 to 8. *Ovary* 2-celled, stigma bifid. *Fruit* 2-coccous; each coccus ellipsoid, pulpy, ·35 to ·5 in. long. *Sapindus Danura*, Voigt Hort. Bot. Suburb. Calc. 94: Hiern in Hook. fil. Fl. Br. Ind. I, 684; Kurz For. Flora, Burma, I, 298. *Scytalia Danura*, Roxb. Hort. Beng. 29; Fl. Ind. II, 274. *Sc. verticillata*, Roxb. Hort. Beng. 29; Fl. Ind. II, 273. *Euphoria verticillata*, Lindl. Bot. Reg. t. 1059; Wall. Cat. 8052 A, B, C. *Dimocarpus verticillata*, Hb. Roxb. ex Wall. *l.c.* A. *Nephelium verticillatum*, G. Don Gen. Syst. I, 670. *E. Danura*, Wall. Cat. 8051. *Didymococcus Danura*, Blume Rumph. III, 103. *D. verticillatus*, Blume *l.c.*

Nicobar Islands; Kurz.—Distrib. British India.

6. Lepisanthes, Blume.

Trees or shrubs. *Leaves* pinnate, exstipulate, alternate; *leaflets* entire, subopposite. *Inflorescence* axillary or lateral, in paniculate spikes. *Flowers* regular or irregular, polygamo-dicœcious. *Sepals* 5–4, widely imbricated in two rows. *Petals* 5–4, equal, each having at the base one or two short wide inflected scales. *Disc* annular, regular or irregular (one-sided). *Stamens* 8 or 10, erect, inserted within the disc. *Ovary* sessile, 3-sided, 3-celled; *ovules* solitary; *style* simple; *stigma* blunt or trigonous. *Fruit* 3-celled, 3-sided, not lobed. *Seeds* solitary, erect, exalbuminous; *cotyledons* very thick, unequal.—Distrib. about 16 species, tropical Asiatic.

Panicles 9 to 12 in. long.			
Fruit 1·5 in. in diam.	...	...	1. *L. Kunstleri.*
Fruit ·8 in. in diam.	...	...	2. *L. andamanica.*
Panicles 1 to 3 in. long.			
Leaflets 4 to 9 in. long	...	...	3. *L. cuneata.*
Leaflets 12 to 18 in. long.			
Fruit tomentose but not echinate		...	4. *L. Scortechinii.*
Fruit tomentose and echinate		...	5. *L. longifolia.*

1. Lepisanthes Kunstleri, King n. sp. A tree 30 to 60 feet high; young branches stout. *Leaves* 30 to 40 inches long, their rachises glabrous: *leaflets* about 12, subopposite, oblong or elliptic-oblong, shortly cuspidate, the base rounded, both surfaces glabrous and reticulate; main nerves 9 to 13 pairs, spreading slightly, ascending; length 6 to 12 in., breadth 2·5 to 3·5 in.; *petiolules* ·3 to ·4 in., stout. *Panicles* slightly supra-axillary, erect, few-branched, shortly pedunculate, 9 to 12 in. long: ultimate branchlets cymose, 3- to 5-flowered, minutely tomentose. *Flowers* ·4 in. long, globular in bud. *Sepals* 5, concave, minutely tomentose outside. *Petals* 5, sericeous in the lower half externally, glabrous in the upper, each with an inflected glabrous bifid basal scale. *Stamens* 8, the filaments sericeous. *Disc* semi-lunar, glabrous.

Ovary (in male flower) rudimentary. *Fruit* sub-globular, with 2 or 3 broad rounded angles, densely rusty-tomentose, 1·5 in. in diam., the pericarp crustaceous: *seeds* 3, large.

Perak: King's Collector, Nos. 4634, 7359.

This resembles *L. montana* to some extent; but has much larger leaves, a more robust and longer inflorescence and larger flowers and fruit. I have not seen female flowers and therefore cannot describe the ovary.

2. Lepisanthes andamanica, King n. sp. A tree? young branches pale when dry, glabrous like all the other parts except the inflorescence. *Leaves* 7 to 12 in. long, equally pinnate: *leaflets* 2 to 4, coriaceous, pale when dry, elliptic-oblanceolate, subacute, slightly oblique and much narrowed to the base, both surfaces minutely reticulate; main nerves 5 to 8 pairs, spreading, slightly prominent beneath: length 4 to 7 in., breadth 1·35 to 2·75 in.; petiolules ·2 to ·5 in., stout. *Panicles* 8 to 10 in. long, with 3 or 5 narrow raceme-like puberulous branches, the ultimate branchlets being few-flowered cymelets. *Flowers* ·25 in. in diam., pedicellate. *Sepals* 5, unequal, obovate, blunt, tomentose outside. *Petals* 5, narrowly obovate-oblong, glabrous with a villous claw and a large oblong basal scale. *Stamens* 8, the anthers glabrous and short, the filaments long and villous. *Fruit* sub-globular, with 3 deep vertical ridges, minutely tomentose, slightly apiculate and with a short thick pseudo-stalk, 3-celled, 3-seeded; the pericarp crustaceous, ·8 in. long, and about as broad.

Andaman Islands: King's Collector.

3. Lepisanthes cuneata, Hiern in Hook. fil. Fl. Br. Ind. I, 680. A shrub; young branches tawny-puberulous. *Leaves* 15 to 30 in. long, the rachises puberulous or minutely tomentose; *leaflets* 10 to 14, sub-opposite or alternate, oblong or elliptic-oblong, the apex bluntly and shortly cuspidate, the base much narrowed; both surfaces reticulate, the lower slightly puberulous towards the base; main nerves 8 to 14 pairs, spreading, curving upwards, rather prominent beneath; length 4 to 9 in., breadth 1·5 to 2·75 in., petiolules ·25 to ·35 in. *Panicles* narrow and spike-like, in fascicles of 3 to 5, axillary or slightly above the leaves, 1 to 3 in. long. *Flowers* ·1 in. in diam.; *bracteoles* subulate, minute. *Sepals* sub-rotund, puberulous. *Petals* 5, glabrous, each with a single inflected scale at its base. *Fruit* broadly ovoid, compressed, with a vertical groove, densely and minutely cinereous-tomentose, crowned by the persistent style and obscurely 2-lobed stigma, two-celled and with a single seed in each cell, ·25 in. broad and about the same in length.

Penang: Porter, Curtis, No. 3009. Perak: Wray, Nos. 1400, 1990, 3563: King's Collector, Nos. 3059, 7072.

4. Lepisanthes Scortechinii, King n. sp. A tree? *Leaves* 2 to 3 feet long, abruptly pinnate: *leaflets* usually 8, sub-opposite, elliptic-oblong, the apex shortly acuminate, the base slightly cuneate; both surfaces glabrous except the midrib and nerves on the lower; main nerves 12 to 14 pairs, spreading, bold beneath and puberulous; length 12 to 18 in., breadth 5 to 7 in.; *petiolules* ·75 to 1 in. long, stout. *Panicles* narrow, raceme-like, axillary, only 2 in. long, pubescent; *bracts* and bracteoles narrow, ·25 in. long; *pedicels* hairy, ·25 in. long: *flower-buds* sub-compressed, ·3 in. in diam. *Sepals* 5, concave, widely imbricate. *Petals* 5, each with a recurved scale at its base. *Disc* glabrous. *Stamens* 8, the filaments hairy, the anthers oblong. *Rudimentary ovary* (in male flower) hairy. *Fruit* sharply 3-angled, with three deep vertical grooves, densely but minutely rusty-tomentose, 1 in. long and about as broad.

Perak: Scortechini, No. 2090.

Fr. Scortechini's specimens are in fruit only. The above description of the flower has been compiled from his field notes on his specimens. The species is notable for its large leaflets.

5. Lepisanthes longifolia, Radlkofer über die Sapindaceen Holländisch-Indiens, p. 35. A shrub 8 to 20 feet high: young parts and inflorescence minutely rusty-tomentose. *Leaves* 2 to 2·5 feet long; *leaflets* about 6, opposite or sub-opposite, narrowly oblong, shortly acuminate or acute, the base narrowed, glabrous on both surfaces; main nerves 14 to 18 pairs, spreading; length 12 to 15 in., breadth 2 to 4 in.; *petiolules* ·4 to ·8 in., puberulous like the rachis. *Racemes* solitary or crowded, sometimes branched, axillary or supra-axillary, 2 to 3 in. long. *Flowers* ·5 in. long, tomentose; *bracteoles* subulate, about ·15 in. long. *Petals* 5, obovate-oblong; the *basal* scale single, short, hairy, flat, entire or bifid. *Fruit* depressed-globular, trigonous and with 3 broad vertical furrows, softly echinate and densely rusty-tomentose, length 1 in., breadth about ·8 in. *Hemigyrosa longifolia*, Hiern in Hook. fil. Fl. Br. Ind. I, 671.

Malacca: Griffith, Maingay, No. 446. Perak: King's Collector, Nos. 5539, 8465, 10220.

An uncommon tree of which only a few specimens exist in collections.

7. Otophora, Blume.

Trees or shrubs. *Leaves* alternate, pinnate, stipulate; *leaflets* entire. *Inflorescence* axillary and terminal. *Flowers* regular, polygamous. *Sepals* 4 or 5, concave, widely imbricated. *Petals* 5, rarely 4, smaller than the sepals, somewhat squamate by inflexion of the subauriculate

base. *Disc* complete, annular, crenulate or entire. *Stamens* 8–9 rarely 5, inserted within the disc; *filaments* very short; *anthers* oblong, included. *Ovary* ovate or elliptic, 2- to 3-celled; *ovules* solitary, ascending; *stigma* subsessile, obtuse, obsoletely 3–4-rayed. *Fruit* baccate, not lobed, indehiscent, 3–4- or by abortion 2–1-celled; *seeds* arillate; *embryo* straight; *cotyledons* thick.—DISTRIB. Species about 12, confined to the Malay Peninsula and Archipelago.

Leaflets sessile ... ... 1. *O. sessilis.*
Leaflets petiolulate ... ... 2. *O. erythrocalyx.*

1. OTOPHORA SESSILIS, King n. sp. A shrub or small tree. *Leaves* 30 or 40 in. long, the base of the petioles slightly swollen: *leaflets* about 10 or 12, sessile, alternate or sub-opposite, coriaceous, broadly oblong or elliptic-oblong, shortly cuspidate, the base slightly narrowed and often minutely cordate: both surfaces glabrous and reticulate, the upper olivaceous when dry, the lower pale brown: main nerves 9 to 15 pairs, spreading, slightly prominent on both surfaces; length 8 to 12 in., breadth 2·75 to 4 in.; *stipules* at the very base of the petiole, ovate-rotund, 2 to 2·5 in. long. *Panicles* axillary, 8 to 10 in. long, consisting of 2 or 3 narrow raceme-like branches. *Flowers* ·25 in. in diam., polygamous. *Sepals* 4, obovate or sub-rotund. *Petals* 4, elliptic, with inflexed scale-like sericeous bases. *Stamens* 6, with short glabrous filaments. *Fruit* ellipsoid, compressed, glabrous, not lobed, nearly 1 in. long and about half an inch broad.

Perak; King's Collector, Nos. 2460, 5043.

This resembles *O. erythrocalyx*, Hiern, but has sessile leaflets which, as well as the stipules, are moreover larger than those of *O. erythrocalyx.*

2. OTOPHORA ERYTHROCALYX, Hiern in Hook. fil. Fl. Br. Ind. I, 680. A small glabrous tree. *Leaves* 30 to 45 in. long, the petioles thickened at the base: *leaflets* 14 to 19, coriaceous, opposite or alternate, elliptic-oblong to elliptic, shortly cuspidate, the base cuneate, both surfaces glabrous and reticulate, the upper olivaceous, the lower brown when dry; main nerves 10 to 13 pairs, spreading, prominent beneath: length 5 to 8 in., breadth 1·5 to 3 in.; petiolules ·4 in., stout: *stipules* ovate, 6 in. long. *Panicles* large, many-branched, 20 to 30 in. long (or even longer), *pedicels* slender. *Flowers* ·15 to ·2 in. long, on slender pedicels. *Sepals* 5, red. *Petals* 5, pale-rose-coloured, each with short inflexed basal scales. *Stamens* 8, filaments thick and hairy; *anthers* pointed, hairy. *Disc* glabrous. *Ovary* 3-gonous, glabrous, the stigma sessile, 3-grooved. *Fruit* ovoid, 3-gonous, glabrous, 1·5 in. in diam., 3-celled; *seeds* arillate.

Malacca: Maingay, No. 447.

8. Xerospermum, Blume.

Trees. *Leaves* alternate, exstipulate, abruptly pinnate; *leaflets* opposite, entire. *Racemes* axillary and terminal. *Flowers* regular, polygamo-dicœcious. *Sepals* 4–5, imbricated in 2 rows. *Petals* 4–5, equal, spathulate, shorter or but little longer than the sepals, without basal scales. *Stamens* 8–7, included, inserted within the annular glabrous disc. *Ovary* sessile, didymous, muricated, 2-celled; *ovules* solitary in each cell, ascending. *Style* short, thick; *stigma* thick, hairy. *Fruit* 1–2-lobed; the *lobes* ellipsoidal, diverging, muricated with pyramidal tubercles, indehiscent, glabrous inside. *Seeds* exarillate; *testa* coriaceous outside, fleshy, pilose, simulating an aril; *embryo* curved; *cotyledons* very large, thickly fleshy, superposed.—Distrib. 3 or 4 species all Malayan.

Sepals and petals 5; leaflets only a single pair ... ... 1. *X. laevigatum.*

Sepals and petals 4; leaflets 1 or 2 pairs.

Leaflets 3 to 6 in. long, minutely reticulate; fruit ellipsoid, muricate, not compressed 2. *X. muricatum.*

Leaflets 4·5 to 8 in. long, transversely reticulate; fruit obliquely elliptic, compressed 3. *X. Wallichii.*

1. Xerospermum laevigatum, Radlk. in Sitzb. Bayer. Akad. Math. Phys. 1878, p. 305. A perfectly glabrous tree. *Leaves* about 4 in. long, with only a single pair of coriaceous elliptic-oblong minutely reticulate shortly acuminate leaflets, 2·25 to 3 in. long and 1 to 1·25 in. broad; their *petiolules* about ·2 or ·25 in. long, slender. *Racemes* terminal and axillary, usually in fascicles of 2 or 3, often with a few branchlets. *Flowers* about ·15 in. in diam., on slender pedicels. *Sepals* 5, rotund, glabrous. *Petals* 5, spathulate, the limb densely woolly, the claw slender. *Stamens* 5; the *filaments* long and woolly, the anthers small and glabrous. *Disc* annular, fleshy, glabrous, waved. *Ovary* tomentose, 2-celled. *Fruit* with 2 or usually only with 1 sharply muricate obovate-ellipsoid compressed coccus, 1·35 in. long and ·85 in. broad.

Malacca: Griffith (Kew Distrib.), No. 1006/1. Penang: Curtis, No. 846. Perak: Scortechini, No. 1019. Pahang: Ridley, No. 2641.

2. Xerospermum muricatum, Radlk. über die Sapind. Holländ.-Indiens, 37, 70. A tree 50 to 80 feet high: *branches* glabrous, dark-coloured when dry. *Leaves* 4 to 9 in. long, equally pinnate: *leaflets* 2 or 4, elliptic-oblong to elliptic, shortly acuminate, the base cuneate; both surfaces glabrous and minutely reticulate: main nerves 7 to 9 pairs, ascending, depressed on the upper, prominent on the lower surface:

length 3 to 6 in., breadth 1·35 to 2 in., petiolules ·35 in. *Racemes* axillary, usually with a few short branchlets, bracteoles small, pedicels as long as the flower-buds. *Flowers* ·2 in. in diam. *Sepals* 4, rotund, nearly glabrous but with ciliate edges. *Petals* 4, shorter than the sepals, the limb rusty-villous. *Disc* fleshy, waved. *Stamens* 8, the filaments pubescent towards the apex, the anthers glabrous. *Fruit* usually reduced by abortion to only one lobe, sharply muricate, 1·25 in. long and ·75 in. in diam. *Xerospermum Norhonianum*, Hiern (not of Blume) in Hook. fil. Fl. Br. Ind. I, 686 (in part); Kurz For. Flora Burma, I, 295. *Nephelium muricatum*, Griffith MSS.

Malacca: Griffith, No. 1004; Maingay, Nos. 444 and 458 also 443 in part; Derry. Perak: very common, King's Collector, Scortechini. Singapore: Ridley.—Distrib. Burma.

Though closely allied to *X. Norhonianum* Radlk. this has more sharply muricated fruit.

2. Xerospermum Wallichii, King, n. sp. A tree 30 to 40 feet high; young branches glabrous, dark-coloured when dry. *Leaves* 12 to 18 in. long, equally pinnate; *leaflets* two pairs, coriaceous, elliptic or obovate-elliptic, shortly and bluntly cuspidate, much narrowed below the middle to the base, both surfaces glabrous and transversely reticulate: main nerves 5 to 7 pairs, depressed on the upper prominent on the lower surface, ascending; length 4·5 to 8 in., breadth 2·25 to 4 in.; petiolules ·25 to ·45 in., stout. *Racemes* axillary, 2 to 4 together, 1 to 2 in. long. *Flowers* ·15 in. in diam. when open, pedicellate. *Sepals* 4, rotund, concave, glabrous but with minutely ciliate edges. *Petals* 4, smaller than the sepals, sub-rotund, with very short claws, densely lanate. *Stamens* 8; *filaments* short and lanate, anthers short and glabrous. *Disc* annular, glabrous, fleshy. *Ovary* broad, compressed, 2-lobed and 2-celled, pubescent. *Fruit* usually with 2 cocci but often with only one, obliquely elliptic, slightly compressed, rarely sub-globular, minutely rugulose, not muricate, when ripe 1·25 in. long and ·75 in. broad. Wall. Cat. Nos. 8083, 8084.

Singapore and Penang: Wallich. Perak: Wray, Nos. 3419, 3580: King's Collector, Nos. 8725, 10611, and 10945. Pahang: Ridley, No. 2570.

Ridley's Pahang specimen has nearly globular fruit. But in other respects it exactly resembles those from the other provinces.

9. Nephelium, Linn.

Trees or shrubs. *Leaves* alternate, exstipulate, pinnate, the leaflets entire. *Inflorescence* terminal and axillary, paniculate or paniculate-racemose or racemose. *Flowers* regular, polygamous. *Calyx* 4- to 6-

lobed, usually cupular, sub-valvate in bud. *Petals* small, villous, rarely with 2 scales, often absent. *Stamens* 6 to 8, inserted within the fleshy glabrous or pubescent disc; *filaments* usually pubescent. *Ovary* pubescent, often verrucose or setose, 1–2- or rarely 3-lobed, the lobes with 1 cell and 1 ovule. *Fruit* 1- rarely 2-coccous, indehiscent, oblong or globose, echinate, tubercled or smooth. *Seed* ellipsoid or globose, covered by a pulpy arillus; *cotyledons* fleshy, not folded.—DISTRIB. About twenty species chiefly Malayan.

Besides the ten species described below, there are in the Calcutta Herbarium specimens of six other species which I am unable to identify with any published species but which, for want either of flowers or of fruit, I am unable to describe.

Leaflets quite glabrous on both surfaces.		
Fruit rugulose but not at all spiny.		
Leaflets elliptic, fruit gibbous at the base	1.	*N. glabrum.*
Leaflets oblong or ovate-lanceolate, fruit not gibbous at the base	2.	*N. Longana.*
Fruit with short glabrous spines ...	3.	*N. rubescens.*
Fruit with long sub-compressed puberulous flexuose stout setae	4.	*N. lappaceum.*
Leaflets glabrous on the upper surface, sub-glaucous and minutely puberulous on the lower surface, never rusty; fruit covered with stout woody spines.		
Petals 5...	5.	*N. costatum.*
Petals 0.		
Leaflets with 9 to 13 pairs of main nerves	6.	*N. chryseum.*
Leaflets with 16 to 24 pairs of main nerves	7.	*N. hamulatum.*
Leaflets glabrous on the upper surface, the lower surface more or less rusty-puberulous or pubescent.		
Petals 0; fruit densely covered with flexuose compressed soft spines	8.	*N. ophiodes.*
Petals 5.		
Leaflets oblong, rarely obovate-oblong; fruit densely covered with flexuose compressed soft spines	9.	*N. eriopetalum.*
Leaflets elliptic, fruit slightly tubercled or almost smooth	10.	*N. malaiense.*
Doubtful species	11.	*N. sufferugineum.*

1. NEPHELIUM GLABRUM, Noronha in Batav. Genootsch. Nerh. V, 80. A tree 60 to 80 feet high; young branches glabrous. *Leaves* 7 to 11 in. long: *leaflets* 4 to 6, coriaceous, elliptic, acute or very shortly and

bluntly acuminate, entire, the base cuneate: both surfaces glabrous and reticulate; main nerves 8 to 10 pairs, spreading and curving upwards; length 3 to 4·5 in., breadth 1·5 to 2·25 in., petiolules ·4 to ·6 in. *Panicles* shorter than the leaves, formed of several slender puberulous raceme-like branches bearing the flowers in few-flowered cymules. *Flowers* less than ·1 in. in diam., diœcious. *Male flower*: *sepals* 5, rotund, pubescent; *petals* 0; *stamens* 6 or 7, the filaments pubescent, exserted; the *ovary* rudimentary. *Female flower*: *calyx* 5-toothed, pubescent; *stamens* not exserted, the filaments very short; *ovary* obovate-oblong, 1-celled (the other cell aborted) rugulose, pubescent; the style from the base of one side of it, recurved at the apex, not bifid. *Fruit* narrowly oblong or clavate, slightly gibbous at the base, sub-glabrous, rugulose but not echinate, 1 in. or more in length, and ·6 or ·7 in. broad. Reinw. in Blume's Cat. Hort. Bot. Bogor.; Hassk. Pl. Jav. Rar. 290; Hiern in Hook. fil. Fl. Br. Ind. I, 687. *Euphoria glabra*, Bl. Bijdr. 233. *Nephelium Maingayi*, Hiern in Hook. fil. Fl. Br. Ind. I, 688. *N. lappaceum*, Linn. var. *glabrum*, Bl. Radlk. über die Sapindac. Holländisch-Indiens, 73, 74.

Malacca: Griffith, Maingay, Derry, Nos. 60, 1171. Singapore: Ridley, Nos. 6210, 6212, 6531, 6070. Perak: Scortechini; King's Collector, Nos. 1058, 3789, 5346, 10621.

This species differs from *N. lappaceum* in so many respects that I cannot at all agree in the view, even although it be held by so great a master of the order as Professor Radlkofer, that it is a mere variety of that species. The one-celled ovary, single style and stigma appear to me to distinguish it at once, not to mention the absence of setae on the ripe fruit and the more slender inflorescence and smaller flowers.

2. Nephelium Longana, Camb. in Mém. Mus. Par. XVIII, 30. A tree 30 to 40 feet high: young shoots rusty-puberulous. *Leaves* 4 to 18 in. long, equally or unequally pinnate, the rachis rusty-puberulous when young afterwards glabrous: *leaflets* coriaceous, oblong or ovate-lanceolate sometimes slightly oblique, shortly acuminate, the base cuneate: both surfaces glabrous and reticulate, the lower glaucous; main nerves 10 to 14 pairs, spreading, rather prominent beneath; length 2·5 to 7 in., breadth 1 to 2 in., petiolules ·3 to ·5 in. *Panicles* terminal and axillary, many-branched, puberulous; branches raceme-like, with ultimate lateral condensed cymules. *Flowers* pedicelled, about ·15 in. in diam. *Calyx* tomentose, deeply 5- to 6-lobed. *Petals* 5 or 6, linear-spathulate, pubescent, nearly as long as the calyx-lobes. *Stamens* 6 to 10, included in the female exserted in the male flowers, the filaments pilose towards the base; *anthers* short and glabrous. *Ovary* 2–3-lobed, tubercled. Fruit-lobe usually solitary by abortion, globular or (in var. *hypoleuca*) ovoid, the epicarp yellowish-red and muricate-areolate, when globose ·5 to ·75

in. in diam. *Seed* solitary, enveloped in a fleshy pale sub-acid arillus. Bot. Mag. t. 4096; W. and A. Prodr. 113; Grah. Bomb. Pl. 29; Blume Rumph. III, 108; Dalz. and Gibs. Bomb. Fl. 35; Thwaites Enum. 58; Miq. Fl. Ind. Bat. I, Pt. 2, 556; Hiern in Hook. fil. Fl. Br. Ind. 1, 688, (in part); Trimen Flora Ceylon, I, 309. *N. Mora*, Gardn. ex Thwaites *l. c.* *N. Bengalense*, G. Don Gen. Syst. I, 570. *Scytalia bengalensis*, Roxb. ex G. Don *l. c.* *Sc. Longan*, Roxb. Hort. Beng. 29; Fl. Ind. II, 270. *Dimocarpus Longan*, Lour. Fl. Cochinch. 233; Trans. Hort. Soc. II, t. 28. *Euphoria Longana*, Lamk. Dict. III, 574; Bot. Reg. t. 1729; Bedd. Fl. Sylv. t. 156; Wall. Cat. 8049. *Sapindus bengalensis*, Roxb. ex W. and A., *l. c.* *Dimocarpus undulatus*, Wight ex W. and A., *l. c.* *E. undulata*, Hb. Heyne ex Wall. *l. c.* *S. monogyna*, Hb. Heyne *l. c.* *D. pupilla*, Moon Cat. 31. *N. pupillum*, Wight Ill. I, 141. *Euphoria pupillum*, Steud. Nom. ed. 2, II, 192.

In most of the Provinces, but probably cultivated.—Distrib. The Tropics generally.

Var. *hypoleuca*, King. Fruit ovoid, 1 to 1·5 in long. *N. hypoleucum*, Kurz in Journ. As. Soc. Bengal for 1871, II, 50: for 1874, II, p. 183: and for 1875, II, p. 187; For. Flora Burma, I, 293: Radlk. Sapind. Holl.-Ind. 28.

Malacca: Maingay, No. 440.—Distrib. Burma.

Hiern reduces *N. hypoleucum* without recognising it as even a variety. Radlkofer, on the other hand regards it as a distinct species. But beyond its oval fruit, I do not see how it differs from typical *N. Longana*, L., and I therefore treat it as a variety of the latter.

3. Nephelium rufescens, Hiern in Hook. fil. Fl. Br. Ind. I, 688. A tree 50 to 60 feet high: young branches cinereous-puberulous, soon becoming glabrous. *Leaves* 6 to 12 in. long: *leaflets* 6 to 10, coriaceous, narrowly oblong or lanceolate-oblong, shortly and bluntly acuminate, entire, the base cuneate or rounded; both surfaces quite glabrous and finely reticulate; main nerves 8 to 14 pairs, faint, spreading; length 2 to 5·5 in., breadth ·75 to 1·65 in., petiolules ·15 to ·25 in. *Panicles* axillary or terminal; the branches racemose, puberulous. *Flowers* rather crowded, pedicellate, ·2 in. in diam. *Calyx* with 5 deep ovate segments with broad bases and acute apices, pubescent. *Petals* 5, narrowly lanceolate, hairy. *Disc* small, glabrous. *Stamens* about 8, exserted, the anthers short and broad, the filaments pubescent. *Ovary* with 2 ovate lobes, villous, 2-celled; *style* stout, shortly divaricate at the apex. *Fruit* with usually only one narrowly-ellipsoid stoutly-echinate glabrous lobe 1·25 in. long and ·5 in. in diam.: the spines short and hollow, compressed and glabrous. Radlk. Sapind. Holl.-Ind. 76. *Euphoria Litchi*, Wall. Cat. 8048 G. and H.

Malacca: Griffith, No. 996; Maingay, No. 452. Singapore: Wallich, Ridley, Nos. 5095, 6211. Perak: King's Collector, Nos. 6523, 6750.

4. Nephelium lappaceum, Linn. Mant. 1, 125. A tree 30 to 60 feet high: young branches rusty-pubescent. *Leaves* 4 to 10 in. long: *leaflets* 4 to 6, elliptic, sub-obovate-elliptic or elliptic-oblong, sub-acute, entire, the base cuneate: both surfaces glabrous and minutely reticulate; main nerves 7 to 9 pairs, ascending, prominent beneath; length 2·5 to 6 in., breadth 1·25 to 3 in., petiolules ·2 to ·25 in. *Panicles* shorter than the leaves, tomentose, terminal and axillary, with numerous racemose branches. *Flowers* ·1 in. in diam., in cymose fascicles on the branches. *Sepals* 4 to 6, sub-valvate. *Petals* 0. *Stamens* 5 to 8, exserted, the filaments pubescent. *Ovary* 2–3-lobed and 2–3-celled, pubescent and echinate. *Style* stout, deeply 2–3-lobed; the *lobes* divergent, recurved. *Fruit* usually with 1 or 2 lobes, each elliptic and densely covered with long sub-compressed recurved soft puberulous setae with broad bases, yellowish-orange to dark purple when ripe, 1 in. long, and ·75 in. in diam. (excluding the setae); aril of the seed pale, fleshy, edible. Gærtn. Fruct. II, 272, t. 140, f. 1; Blume Rumph. III, 103: Lamk. Ill. t. 764; Hassk. Pl. Jav. Rar. 287; Miq. Fl. Ind. Bat. 1, pt. 2, p. 554; Hiern in Hook. fil. Fl. Br. Ind. I, 687. *Euphoria Nephelium*, DC. Prodr. I, 612; Bl. Bijdr. 235; Wall. Cat. 8053 (excl. part of B). *Scytalia Ramboutan*, Roxb. Hort. Beng. 29; Fl. Ind. II, 271. *Dimocarpus crinita*, Lour. Fl. Cochinch. 234. *N. echinatum*, Noronh. in Batav. Genootsh. Verh. V, 80.

In all the Provinces except the Nicobars and Andamans: often cultivated for its fruit which is known as the *Ram Boutan*.

5. Nephelium costatum, Hiern in Hook. fil. Fl. Br. Ind. I, 688. A tree 50 to 60 feet high: young branches puberulous, slightly lenticellate. *Leaves* 6 to 12 in. long, equally pinnate: *leaflets* 4 to 10, coriaceous, oblong-lanceolate to elliptic, the apex sub-acute or shortly and bluntly acuminate, the base slightly narrowed but rounded, upper surface glabrous, the lower minutely puberulous near the nerves but becoming glabrescent, sub-glaucous; main nerves 10 to 18 pairs, spreading, prominent beneath: length 2·75 to 5·5 in., breadth 1·25 to 1·75 in., petiolules ·25 in. *Panicles* usually 3 or 4 together, mostly axillary, 4 to 6 in. long, puberulous, the branches short, racemose. *Flowers* ·2 in. in diam., pedicelled, in short cymules. *Sepals* 5, sub-rotund, thick, minutely tomentose outside and pubescent inside. *Petals* 5, much smaller than the sepals, spathulate, villous. *Disc* large, flat, glabrous. *Stamens* 8 to 12, exserted, the filaments hairy at the base, the anthers glabrous. *Ovary* broadly ovate, 2-lobed, covered with coarse villi; *style* short, stout, simple. *Fruit* of two or usually of only one sub-globular lobe densely covered with long stout curved puberu-

lous blunt setae, diam. (when not quite ripe and to the ends of the setae) ·75 in. Radlkofer Sapind. Holl.-Ind. 76.

Malacca, Maingay, No. 454. Perak : Scortechini, Nos. 30, 1992.

6. NEPHELIUM CHRYSEUM, Blume Rumphia, III, 105. A tree 30 to 50 feet high : young branches puberulous or glabrescent. *Leaves* 6 to 12 in. long ; their rachises slender, cinereous-puberulous : *leaflets* 4 to 8, sub-coriaceous, oblong to elliptic-oblong, shortly and often rather bluntly acuminate ; the base much narrowed and sometimes oblique ; upper surface glabrous and shining, the lower sub-glaucous and sparsely puberulous ; main nerves 9 to 13 pairs, spreading and curving : length 2·5 to 5 in., breadth 1·25 to 1·75 in., petiolules ·15 in. *Panicles* axillary, solitary or several together, 3 to 4 in. long, with few raceme-like branches ; the flowers shortly pedicelled and in small clusters, ·15 in. in diam. *Calyx* deeply cut into 5 or 6 broadly-oblong blunt teeth, minutely tomentose. *Petals* 0. *Stamens* 7 or 8, exserted or not ; the anthers broadly ovate, sparsely pubescent ; the filaments short, pubescent. *Disc* sub-glabrous, sulcate. *Ovary* compressed, reniform, bilobed, rusty-pubescent ; the style stout, pubescent, longer than the ovary, bifid at the apex, the lobes recurved. *Fruit* usually 1-lobed, sub-globose, densely covered with conical compressed striate woody spines, diam. to the tips of the spines about 2 in. : *seed* with a large succulent aril. Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 554. *Euphoria chrysea*, Korth. MSS.

Perak : King's Collector, Scortechini. Selangor ; Ridley No. 407. Singapore : Ridley, Nos. 6358, 6374.—DISTRIB. Borneo.

7. NEPHELIUM HAMULATUM, Radlk. üb. Sapind. Holl.-Ind. 78. A tree ; young branches rusty-puberulous. *Leaves* 10 to 15 in. long, their rachises rusty-puberulous : *leaflets* 6 to 10, oblong, shortly acuminate, rarely acute, the base cuneate ; upper surface minutely reticulate and glabrous except the puberulous midrib ; the lower sub-glaucous, covered with very minute pale pubescence, the 16 to 24 pairs of spreading nerves rusty-pubescent and very prominent ; length 2·5 to 4·5 in., breadth 1 to 1·75 in., petiolules ·15 in. *Panicles* terminal or axillary, 4 to 6 in. long ; the branches few, slender and raceme-like, densely tomentose. *Flowers* ·1 in. in diam., numerous, in small cymules, on pedicels a little longer than themselves. *Calyx* tomentose outside, deeply divided into 4 broad rather unequal blunt segments. *Petals* 0. *Stamens* 6 or 7, exserted, the anthers broadly-ovate and sub-glabrous, the filaments long and pubescent. *Ovary* 2-lobed, rusty-villous. *Fruit* with only a single lobe developed, ovoid, densely covered with stout rusty-puberulous woody spines with broad slightly compressed sub-glabrous bulbous bases, nearly 1·5 in. long to the tips of the spines, and 1 in. or more in diam.

Malacca : Maingay, No. 450 ; Derry, Nos. 1094, 1304, 1882.

8. Nephelium ophiodes, Radlk. Sapind. Holl.-Ind. 78. A tree 50 to 80 feet high : young branches rusty-puberulous. *Leaves* 12 to 18 in. long, their rachises 3-angled ; *leaflets* 6 to 10, very coriaceous, oblong, rarely elliptic-oblong, very shortly and bluntly acuminate, the base slightly narrowed and oblique ; upper surface glabrous, the lower minutely scaly and rusty-puberulous ; main nerves 15 to 18 pairs, spreading and curving upwards, slightly depressed on the upper bold and prominent on the lower surface ; length 6 to 8 in., breadth 2 to 2·5 in., petiolules ·2 to ·25 in. *Panicles* axillary or terminal, sometimes pedunculate, 8 to 16 in. long, much branched, rusty-tomentose. *Flowers* ·15 in. in diam., shortly pedicelled. *Calyx* tomentose, deeply divided into 5 or 6 broadly triangular acute lobes. *Petals* 0. *Disc* glabrous. *Stamens* 6 to 8, slightly if at all exserted : *filaments* subulate, pubescent ; *anthers* short and puberulous. *Ovary* abortive on one side, broadly ovoid, densely setose-pubescent, 1-celled. *Fruit* with only one lobe developed, oblong-ovoid, densely covered with long flexuose puberulous setae, 1·5 in. long and 1 in. in diam. *N. eriopetalum*, Hiern in Hook. fil. Fl. Br. Ind. I, 689 (in part).

Malacca : Maingay, No. 453. Perak : King's Collector, Nos. 5481, 7140.

9. Nephelium eriopetalum, Miq. in Fl. Ind. Bat. Suppl. 508. A large tree : the young parts, the rachises of the leaves, the under surfaces of the leaflets and the inflorescence minutely rusty- or fulvous-tomentose or pubescent. *Leaves* 12 to 24 in. long : *leaflets* 6 to 10, thickly coriaceous, oblong, rarely obovate-oblong, sub-acute, slightly narrowed to the rounded or cuneate base : upper surface glabrous and shining except the tomentose midrib ; the lower brown, tomentose or pubescent, with the 16 to 24 pairs of spreading main nerves and the transverse reticulations prominent ; length 4 to 12 in., breadth 1·65 to 4 in., petiolules ·25 to ·35 in., tomentose, stout. *Racemes* in small clusters in the leaf-axils, pendent, 4 to 10 in. long (longer in fruit) ; the flowers in glomeruli, shortly pedicelled, ·25 in. in diam. *Calyx* with 5 deep triangular sub-acute spreading teeth, pubescent externally, glabrescent internally. *Petals* 5 or fewer, oblong and blunt, or subspathulate, much narrower than the calyx-teeth, pubescent. *Disc* lobulate, pubescent. *Stamens* about 10, not exserted, anther oblong, filament short, both sparsely pubescent. *Ovary* slightly compressed, 2-lobed, rusty-setose : *styles* 2, longer than the ovary, pubescent, divaricating, recurved. *Fruit* ovoid, densely covered with flexuose compressed puberulous soft spines, about 2 in. long (measured to the ends of the spines) and about 1·5 in. in diam. Hiern in Hook. fil. Fl. Br. Ind. I, 689.

Malacca : Maingay, No. 448. Singapore : Ridley, Nos. 4584, 6022. Perak : Scortechini, No. 143 : Wray, No. 1300.—Distrib. Sumatra.

10. Nephelium Malaiense, Griff. Notul. IV, 549. A tree; young branches with much scurfy tawny minute pubescence and elongated lenticels in rows. *Leaves* 10 to 14 in. long, their rachises angled and covered with minute tawny scurfy tomentum; *leaflets* 6 to 8, subopposite, thinly coriaceous, usually elliptic, sometimes elliptic-oblong, shortly cuspidate, very slightly narrowed to the rounded slightly oblique base; upper surface glabrous, the lower with small hairs on the nerves and prominent reticulations; main nerves 15 to 18 pairs, spreading; length 3·5 to 5 in., breadth 2 to 2·5 in.; petiolules ·15 in., tomentose. *Panicles* terminal, minutely rusty-glandular-tomentose, 6 to 9 in. long, branches rather numerous. *Flowers* in fascicles on the raceme-like branches, shortly pedicelled, ·25 in. in diam. *Calyx* pubescent, with 5 deep ovate-rotund obtuse lobes. *Petals* 5, about as long as the calyx-lobes but narrower, obovate, villous inside. *Stamens* 8, short, scarcely exserted; *anthers* glabrous, shorter than the filaments. *Ovary* 2-lobed, rusty-setose, the style about as long as the ovary; the *stigma* capitate, 2-lobed. *Fruit* (*fide* Hiern) slightly tubercled or almost smooth, globose, ·65 to ·75 in. in diam. *Seed* globular, its arillus fleshy.

Malacca: Griffith, No. 999; Maingay, No. 455.

I have not seen the fruit of this, and the description above given is copied from Hiern.

Doubtful species.

11. Nephelium sufferrugineum, Radlk. üb. Sapind. Holländ.-Ind. 77. A tree: young branches minutely rusty-tomentose. *Leaves* 6 to 8 in. long, the rachises puberulous: *leaflets* 2 pairs, thinly coriaceous, elliptic or obovate-elliptic, sub-acute, the base cuneate; upper surface glabrous and minutely reticulate, the lower minutely densely adpressed-puberulous; main nerves 9 to 11 pairs, ascending, rather straight, prominent on the lower surface; length 2·75 to 4 in., breadth 1·75 to 2·25 in., petiolules ·2 in. *Panicles* about as long as or shorter than the leaves, crowded, axillary, rusty-pubescent, their branches racemose. *Flowers* ·2 in. in diam., shortly pedicelled. *Calyx* rusty-tomentose, deeply cut into 5 broadly ovate sub-acute lobes. *Petals* 0. *Disc* glabrous. *Stamens* about 8, the anthers glabrous, the filaments subulate and hairy. *Ovary* not lobed, sub-globular, rusty-pubescent, much shorter than the simple sub-glabrous style.

Malacca: Griffith, No. 1000.

I have not seen fruit of this; but Radlkofer describes it as follows: —"fructus aculeis brevioribus e basi obconica filiformibus hamato-curvatis glabris laxius muricatis." The fruit thus attributed to the species is however not attached to the branches in Griffith's specimens,

which are the only ones known. It is therefore doubtful whether they really belong to the former which, but for the pubescence on the under surface of the leaves, might belong to *N. glabrum*, Noronha.

10. Pometia, J. R. & G. Forst.

Tall trees. *Leaves* alternate, pinnate ; leaflets subopposite, entire or serrate (the lowest pair usually stipuliform). *Racemes* simple or panicled, elongated, slender. *Flowers* regular, polygamous, fascicled, small, shorter than their pedicels. *Calyx* cup-shaped, 5-4-fid, valvate in bud. *Petals* 5–4, small, usually without scales. *Disc* complete, annular, lobed. *Stamens* 4–8, usually 6–4, inserted within the disc, at length much exserted; *anthers* small. *Ovary* 2–3-coccous and -celled ; *ovules* solitary. *Style* elongated; *stigma* obtuse, emarginate. *Fruit* 1–2-coccous; *lobes* subglobose or ellipsoidal, indehiscent, smooth. *Seeds* exalbuminous, covered with a mucilaginous aril.—Distrib. Species about 4, in Malaya Ceylon and Australasia.

Calyx and leaflets quite glabrous, panicles sub-glabrous ... ... 1. *P. macrocarpa.*

Calyx always pubescent, leaflets glabrous or pubescent; inflorescence puberulous or pubescent.

Leaves 12 to 24 in. long ... ... 2. *P. pinnata.*

Leaves 3 to 8 in. long.

Leaflets oblanceolate, caudate-acuminate; petals oblong, much longer than the calyx; panicles much longer than the leaves ... 3. *P. gracilis.*

Leaflets oblong or oblong-oblanceolate, not caudate-acuminate ; petals often absent, if present rotund and not much exceeding the calyx ; panicles not longer than the leaves 4. *P. alnifolia.*

1. Pometia macrocarpa, Kurz in Journ. As. Soc. Bengal, Vol. XLIV, pt. II, (1875), p. 205. A glabrous tree ; *leaves* 9 to 12 in. long, the rachises glabrous and the petioles thickened at the base : *leaflets* coriaceous, oblong or elliptic-oblong, slightly unequal-sided, shortly acuminate, the edges with remote glandular teeth, the base rounded ; both surfaces quite glabrous, the lower paler and with the reticulations distinct, the midrib prominent on both ; main nerves 15 to 18 pairs, spreading, depressed on the upper, prominent on the lower surface ; length 4·5 to 6 in., breadth 1·75 to 2 in. ; petiolules ·2 in., stout. *Panicles* axillary, about as long as the leaves, with several sub-glabrous racemoid branches bearing the flowers in cymules. *Flowers* ·1 in. in diam., on glabrous pedicels twice as long as themselves. *Calyx* glabrous, 5-lobed. *Petal*

0. *Stamens* 5; *anthers* broadly ovate, glabrous: filaments pubescent and thickened towards the base. *Ovary* sparsely pubescent, 2-lobed. *Fruit* ovoid, glabrous, 1·5 to 2 in. long; the pericarp thick, spongy inside. *Seed* single with a short arillus. Radlk. üb. Sapind. Holl.-Ind. No. 82.

Malacca: Maingay, No. 463.

A species known only by Maingay's scanty and imperfect specimens.

2. Pometia pinnata, Forst. Char. Gen. 110. A tree 30 to 50 feet high; young branches puberulous or glabrescent. *Leaves* 12 to 36 in. long, equally pinnate, the rachises angled, the petioles swollen at the base, glabrous or glabrescent; *leaflets* 4 to 12 pairs, sub-opposite, thinly coriaceous, oblong or oblanceolate-oblong, acute or shortly acuminate, the edges coarsely and remotely serrate, the base rounded sub-cordate or cuneate; the lower leaflets smaller than the upper: the lowest very small, sub-rotund, and sometimes less than 1 in. long: the upper varying in length from 4 to 12 in. and in breadth from 1·75 to 4 in.; petiolules ·15 in., stout: both surfaces glabrous or puberulous, often pubescent on the midrib and nerves, the reticulations minute; main nerves numerous, parallel, prominent beneath. *Panicles* axillary or terminal, spreading, puberulous, shorter than the leaves, their branches spreading and often with auricled bracts at their bases. *Flowers* numerous, pedicellate, ·1 in. in diam., polygamous. *Calyx* pubescent, deeply divided into 4 or 5 triangular teeth. *Petals* 4 or 5, small, glabrous or slightly pubescent, without a basal scale. *Disc* fleshy, lobed, glabrous. *Stamens* 5 or 6, the anthers glabrous, the filaments subulate and puberulous. *Ovary* obcordate, bilobed: *style* longer than the ovary, bifid at the apex. *Fruit* usually reduced to a single lobe, ellipsoid, blunt, glabrous, 1-seeded, variable in size; length from ·75 to 1·25 in.; diam. from ·5 to ·8 in. *P. tomentosa*, Kurz Andaman Report, ed. 2, p. 34; For. Flora Burma, I, 295; Hiern in Hook. fil. Fl. Br. Ind. I, 691. *Irina glabra*, Blume Bijdr. 230; Rumphia, III, 113; Hassk. Pl. Jav. Rar. 284; Miq. Fl. Ind. Bat. I. pt. 2, 558. *Irina diplocardia*, Blume Rumphia, III, 115. *Pometia eximia*, Bedd. Fl. Sylv. t. 157. *Eccremanthus eximius*, Thwaites in Hook. Kew Journ. VII, 272, t. 9. *Nephelium eximium*, Thwaites Enum. 57.—Rumph. Herb. Amboin. III, 81, t. 17.

Malacca: Maingay, No. 459. Perak: very common; King's Collector.—Distrib. Ceylon.

3. Pometia gracilis, King n. sp. A tree 40 to 50 feet high; the *branches* slender, drooping, the youngest cinereous-puberulous, minutely lenticellate. *Leaves* 5 to 8 in. long, their rachises minutely rusty-pubescent; *leaflets* 5 to 8, opposite, membranous, the upper ones the

largest and oblanceolate, the lower often oblong, all caudate-acuminate, the edges with small remote glandular teeth ; the base much narrowed in the upper leaflets, oblique and rather rounded in the lower ; upper surface reticulate, shining, glabrous except the pubescent midrib, the lower reticulate and glabrous but pubescent on the midrib and nerves ; length 3 to 6 in., breadth 1 to 1·6 in. ; petiolules ·1 in. or less, pubescent. *Panicles* much longer than the leaves, axillary or terminal, slender, with a few raceme-like branches bearing the flowers in small uniparous lateral cymules. *Flowers* ·05 in. in diam. *Calyx* campanulate, deeply divided into 5 ovate sub-acute pubescent teeth. *Petals* 5, longer than the calyx, oblong, truncate, pubescent inside. *Stamens* 5, exserted, the anthers broadly ovate, glabrous : filaments long, pubescent and thickened at the base. *Disc* cupular, fleshy, glabrous. *Ovary* bilobed, rusty-pubescent ; *style* short, glabrous. *Fruit* with 2 or more often with 1 ellipsoid glabrous shining lobe, ·75 in. long and ·5 in. in diam.

Perak : King's Collectors, Nos. 3479, 3607, 3781, 4514, 7255 : Wray, No. 2912. Singapore : Ridley, No. 6373.

This differs from *P. alnifolia* in having its leaflets caudate-acuminate at the apex and much more narrowed at the base, and in the midribs and nerves on the lower surface being pubescent as well as the midrib on the upper. The panicles are besides very much longer, and the flowers have longer pedicels than in *P. alnifolia* ; while the petals, which seem to be always present, much exceed the calyx-lobes.

4. Pometia alnifolia, Radlk. über Sapind. Holl.-Ind. 30. A tree 50 to 70 feet high : young branches pubescent, reddish when young. *Leaves* 3 to 8 in. long, equally or unequally pinnate, the rachises slender and pubescent, the petiole not swollen at the base but often with a minute stipule-like leaflet. *Leaflets* 6 to 9, opposite or alternate, oblong, or oblanceolate-oblong, sub-coriaceous, shortly acuminate, the edges with remote minute glandular teeth ; slightly narrowed to the rounded or cuneate base ; upper surface glabrous, shining ; the lower pale and with a few scattered hairs ; main nerves spreading, numerous, parallel, prominent below, length of the upper leaflets 3 or 4 in., breadth ·9 to 1·25 in., the lower leaflets smaller and the lowest of all minute. *Panicles* terminal, axillary, minutely tomentose, about as long as the leaves, with a few racemoid branches bearing the flowers in lateral cymules. *Flowers* less than ·1 in. in diam. ; *bracts* linear pubescent, pedicels short. *Calyx* with 5 deep valvate puberulous triangular segments. *Petals* 5, usually shorter than the calyx, sub rotund. villous at the apex inside, or absent. *Stamens* 5, slightly exserted, the anthers short, the filaments glabrous. *Disc* cupular, fleshy, glabrous

Ovary obcordate, 2-lobed, pubescent, style glabrous. *Fruit* usually with only one properly developed lobe (the other sub-aborted) oval and blunt, or sub-globose, glabrous, 1 in. long and ·5 in. in diam.; when globular ·5 to ·6 in. in diam. *Irina alnifolia*, Blume Rumphia III, 117.

Perak: King's Collector, Nos. 3790, 6949, 7774, 7983, 8212; Scortechini, No. 113; Wray, No. 1336. Singapore: Ridley, 6372. Penang: Curtis, No. 1600.

A species with much smaller leaves leaflets and inflorescence than *P. pinnata*, Forst. Miquel (Fl. Ind. Bat. Vol. I, pt. 2, 558) reduces it to *T. tomentosa*, Bl. which is in my opinion doubtfully distinct from *T. glabra*, Blume. But *P. alnifolia* appears to me a perfectly good distinct species recognisable at a glance from every form of *P. pinnata*, Forst.

Besides the preceding there are in the Herbarium Calcutta two species of *Pometia* which, for want of complete material, I do not describe. One of these is from Penang (Curtis, No. 1668). It has entire leaflets somewhat like those of *P. alnifolia*, and globular fruit. *Flowers* are quite wanting. For it I propose the name *P. Curtisii*. The other is from Negri Sembilan, communicated by Mr. H. N. Ridley. It also has leaflets somewhat like those of *P. alnifolia*, but broader and with entire undulate edges. The inflorescence and flowers are quite glabrous. Fruit is wanting. To this I have given the MSS. name *P. Ridleyi*.

11. Guioa, Cav.

Erect shrubs or trees. *Leaves* alternate, exstipulate; *leaflets* 1 to 6 (rarely 10) pairs; more or less lanceolate, oblique, entire, often coriaceous. *Flowers* in simple or branched racemes, axillary or from the axils of fallen leaves, sub-globose in bud. *Sepals* 5, ovate-rotund, thick, concave, imbricate in 2 rows, pubescent at the edges. *Petals* 5, each with 2 pectinate scales. *Disc* entire, annular, or semilunar, or crescentic. *Stamens* 8. *Ovary* 3-angled, with a single curved style and 3-lobed stigma. *Fruit* sessile or pedicelled, obliquely obcordate, boldly 3-winged, glabrous, the interior of the pericarp cartilaginous. *Seeds* wholly or partly enveloped in a thin arillus with 2 flexuose appendages. *Cotyledons* fleshy and oily, the inner obliquely conduplicate; the radicle inferior.—Distrib. About 33 species Malayan and Australian.

Rachises of the leaves narrowly winged ...	1.	*G. pleuropteris.*
Rachises of the leaves terete		
Leaflets glabrous on both surfaces ...	2.	*G. squamosa.*
Leaflets sparsely pubescent on the upper, pubescent on the lower surface... ...	3.	*G. fuscidula.*
Leaflets densely tomentose on the lower surface	4.	*G. pubescens.*

1. Guioa pleuropteris, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1839), p. 611. A shrub or sometimes a tree: young branches minutely rusty-pubescent. *Leaves* 4 to 7 in. long, their rachises narrowly winged and puberulous, usually unequally pinnate: *leaflets* 3 to 7, ovate-lanceolate or ovate-oblanceolate, acute or broadly and shortly cuspidate, the base cuneate: upper surface with short scattered hairs; the lower pale, minutely punctate and more pubescent than the upper: main nerves about 5 pairs, rather distinct beneath: length 2·5 to 4·5 in., breadth 1 to 1·75 in., petiolules ·1 in. *Racemes* branched, 2 to 4 in. long. *Fruit* ·75 in. broad, the wings narrow, contracted below into a short pseudostalk, pedicel ·3 in. long. *Cupania pleuropteris*, Blume Rumphia III, 158; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 564; *C. pleuropteris* var. *apiculata*, Hiern in Hook. fil. Fl. Br. Ind. I, 677. *Cupania Griffithiana*, Kurz in Journ. As. Soc. Beng. Vol. XLIV, pt. 2, (1875), p. 188, in part; For. Flora Burma, I, 284.

Malacca: Maingay, No. 442. Johore: Ridley, No. 4064. Pahang: Ridley. Perak: King's Collector, Nos. 311, 1136.—Distrib. Sumatra Rieu, Borneo.

Var. *bijuga*. Leaflets 2 pairs, the rachis slightly dilated towards the apex. *G. bijuga*, Radlk. *l. c.* 611. *Cupania pleuropteris*, var. *bijuga*, Hiern in Hook. fil. Fl. Br. Ind. I, 677. *C. (indeterminata)* Wall. Cat. 8094. *C. Griffithiana*, Kurz in Journ. As. Soc. Beng. XLIV, pt. 2, (1875), p. 188.

Malacca: Griffith, No. 984. Maingay, No 137.

2. Guioa squamosa, Radlk. in. Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 609. A slender tree from 20 to 30 feet high; young branches rusty-puberulous, dark-coloured when dry. *Leaves* 6 to 10 in. long, sometimes foveolate or punctate beneath; *leaflets* 4 to 8 pairs, lanceolate to ovate-lanceolate, shortly and bluntly acuminate, sub-falcate, the base narrowed and oblique; both surfaces glabrous; main nerves 8 to 10 pairs, rather distinct beneath, curving, the secondary nerves and reticulations distinct. *Panicles* raceme-like, 2 or 3 in. long, almost glabrous. *Fruit* 1 in. across, the wings broad, subundulate, suddenly narrowed to a short stout pseudo-stalk; the *style* persistent, broad at the base: *pedicel* 2·5 in. long. *Cupania regularis*, Kurz (not of Blume) Journ. As. Soc. Bengal, Vol. XLIV, pt. 11 (1875), 188. *Cupania glabrata*, Hiern (not of Kurz), Hook. fil. Fl. Br. Ind. I, 676. *Sapindus squamosus*, Wall. (not of Roxb.) and Cat. No. 8097; "*Connaracea?*" Wall. Cat. 8550.

Penang: Wallich, King's Collector, No. 1516. Singapore: Ridley, No. 6209*a*. Malacca: Griffith.—Distrib. Java; Burma, Helfer, No. 983.

3. Guioa fuscidula, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 609. A tree 30 to 40 feet high: young branches puberulous, dark-coloured. *Leaves* 4 to 12 in. long; *leaflets* usually equally pinnate (3 to 4 pairs), elliptic, oblique, sub-acute, slightly narrowed at the base: the upper surface sparsely puberulous, the midrib pubescent; the lower pubescent, becoming glabrescent when old: main nerves 6 or 7 pairs, distinct beneath as are the reticulations; length 2 to 3 in., breadth 1 to 1·5 in., petiolules ·2 in. *Racemes* about 2 in. long, pubescent. Scales of petals woolly. *Fruit* about ·5 in. broad, narrowed to a long pseudo-stalk, *pedicel* ·25 in. long. *Cupania fuscidula*, Kurz in Journ. As. Soc. Bengal, for 1872, p. 302; For. Flora Burma, I, 284; Hiern in Hook. fil. Fl. Br. Ind. I. 677.

Perak: King's Collector, Nos. 2452, 3818. Burmah (Tenasserim): Helfer, No. 993.

Var. *glabrescens*, leaflets, except the midrib, almost glabrous.

Perak: Scortechini, No. 1714.

4. Guioa pubescens, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 612. A small tree; young shoots tawny-puberulous. *Leaves* 6 to 9 in. long, usually equally pinnate, their rachises terete and puberulous; *leaflets* 4 to 5 pairs, alternate, narrowly oblong-lanceolate, falcate, acuminate, the bases much narrowed and oblique; upper surface with a few minute adpressed scattered hairs, the lower densely covered with minute tawny tomentum; main nerves 5 to 7 pairs, faint, curving; length 2 to 3 in., breadth ·65 to 1·1 in., petiolules ·15 in. *Panicles* racemose, about 3 in. long, puberulous. *Fruit* ·6 in. broad, the wings narrow, pseudo-stalk shorter than the pedicel, pedicel ·25 in. *Cupania pallidula*, Hiern in Hook. fil. Fl. Br. Ind. I, 676. *C. Griffithiana*, Kurz in Journ. As. Soc. Beng. XLIV, pt. 2 (1875), p. 188; For. Flora Burma, I, 284 (in part).

Malacca: Griffith, No. 982; Maingay, No. 436. Singapore: Hullett, Ridley, No. 1912.—Distrib. Java, Sumatra, Bangka.

12. Trigonachras, Radlk.

Trees with pinnate 5- to 10-jugate narrowly lanceolate somewhat falcate entire eglandular leaflets. *Panicles* racemose, terminal or axillary. *Calyx* small, cupular, with 5 spreading imbricate segments. *Petals* 5, each with 2 pectinate scales. *Disc* entire, swollen, annular. *Stamens* 8 *Fruit* large, clavate-pyriform; the pericarp thick, crustaceous; bluntly 3-angled, minutely tomentose, 3-celled, usually (by abortion) only 1-seeded. *Seed* pyriform-ovoid, exarillate.

Trigonachras acuta, Radlk. in Sitzb. Bayer. Akad. Math. Phys. IX (1879), p. 672. A tree; young shoots rusty-puberulous. *Leaves* 8 to 12

in. long; their rachises terete, glabrous; *leaflets* 11 to 15, narrowly oblong-lanceolate, shining on both surfaces: main nerves 8 to 10 pairs, faint, spreading; length 2 to 3·5 in., breadth ·6 to ·8 in., petiolules ·2 in. *Racemes* paniculate, erect, terminal or axillary, tawny-tomentose, the flowers on long tomentose bracteolate pedicels. *Calyx* tomentose externally. *Stamens* long-exserted, the filaments hairy. *Fruit* apiculate, nearly 2 in. long and 1·2 in. in diam. *Cupania acuta*, Hiern in Hook. fil. Fl. Br. Ind. I, 676. *Sapindacea*, Wall. Cat. 9036.

Singapore: Wallich, Hullett; Ridley, No. 4648. Pahang: Ridley. Malacca: Maingay, No. 445.

13. Arytera, Blume.

Shrubs or trees with pinnate 1–5-jugate leaves: the *leaflets* elliptic or lanceolate, entire, sometimes foveolate in the nerve-axils underneath, *Panicles* axillary or terminal. *Calyx* small, cupular; the sepals 5, imbricate. *Petals* 5, each with 2 pectinate basal scales. *Disc* entire, annular. *Stamens* 8. *Fruit* 2- to 3-celled, shortly stipitate, lobed; the lobes elliptic, obcordate or obovate, always divaricate: the pericarp fleshy outside, sclerenchymatous inside. *Seed* entirely or almost entirely enveloped in an inappendiculate arillus; *cotyledons* thick, fleshy, superposed, radicle short.—Distrib. Malayan Archipelago and Peninsula, S. China and Australasia; about twenty species.

Arytera littoralis, Blume Rumphia, III, 170. A tree 25 to 30 feet high: young branches rusty-puberulous. *Leaves* abruptly pinnate, 6 to 13 in. long, their rachises rusty-puberulous becoming glabrescent, not winged; *leaflets* 2 or 3 pairs, elliptic to elliptic-oblong, sub-acuminate, the base cuneate, both surfaces glabrous; main nerves 8 to 10 pairs, slightly prominent beneath, ascending, curved; length 3 to 6 in., breadth 1·5 to 3 in.; petiolules ·25 in., stout. *Panicles* axillary, short, many-branched, rusty-puberulous. *Flowers* minute. *Calyx* with 5 short teeth, pubescent outside. *Petals* 5, slightly longer than the calyx, broadly cuneate, obliquely emarginate or bifid at the apex, pubescent on the upper surface. *Anthers* puberulous, filaments hairy. *Fruit* coriaceous, glabrous, 2-lobed; the lobes usually compressed, oblong, blunt, one of them often smaller than the other. Radlkofer in Sitzb. Bayer. Akad. Math. Phys. IX, (1875), p. 552. *Cupania adenophylla*, Planch. ex Hiern in Hook. fil. Fl. Br. Ind. I, 677; Kurz For. Flora Burma, I, 285. *Sapindus adenophyllus*, Wall. Cat. 8044.

Malacca: Griffith, Maingay, No. 439. Andamans: King's Collectors. Nicobars: Jelinek. Pahang: Ridley, No. 2162.—Distrib. Burma: Helfer, 989; Griffith, 988. Sumatra: Forbes, No. 2624.

Var. *major*. A tree 30 to 70 feet high; *leaflets* with 12 to 14 pairs of nerves: *lobes* of fruit oblong, only slightly compressed.

Perak: King's Collector, Nos. 695, 885, 4456; Scortechini, No. 20; Wray, No. 316. Singapore: Ridley, No. 5995. Selangor: Ridley, No. 1609.

14. Mischocarpus, Bl.

Trees with alternate exstipulate unequally pinnate leaves: *leaflets* 1 to 5 pairs, ovate-lanceolate or elliptic, entire, usually glabrous. *Racemes* axillary, simple or branched. *Calyx* small, cup-shaped, 5-partite, the segments imbricate. *Petals* 5, each with 2 large pectinate scales, or absent. *Disc* entire, annular. *Stamens* 8 or fewer. *Fruit* pyriform, blunt, 3-angled or 3-grooved, or smooth, pedicelled, rarely sessile, 3-celled: the pericarp thin, fleshy, sclerenchymatous inside. *Seeds* more or less completely enveloped in a thin arillus with 2 spur-like processes near its base. *Cotyledons* lying above each other, radicle short.—Distrib. About a dozen species, Malayan and Australasian.

Petals 5, minute, caducous ... ... 1. *M. fuscescens.*
Petals 0.
Fruit truncately pyriform, boldly 3-angled... 2. *M. sundiacus.*
Fruit pyriform, not truncate, not angled ... 3. *M. sumatranus.*

1. Mischocarpus fuscescens, Blume Rumphia III, 166. A tree 50 to 70 feet high: all parts except the inflorescence glabrous. *Leaves* 9 to 12 in. long, equally or unequally pinnate; *leaflets* 4 to 6, elliptic-oblong or oblong-lanceolate, sub-acuminate, cuneate at the base, both surfaces shining and finely reticulate, foveolate in the axils beneath; main nerves 12 to 15 pairs, slightly conspicuous beneath, curving: length 4 to 8 in., breadth 1·5 to 2 in.; petiolules ·25 in., stout. *Panicles* axillary or terminal, erect puberulous; the branches few, racemose with the flowers in small cymes. *Calyx* sub-valvate. *Petals* 5, minute. *Stamens* 8. *Disc* hairy. *Ovary* pyriform, entire, stipitate. *Fruit* obovoid, with a faint vertical ridge, glabrous, ·4 in. long, its pseudo-stalk ·25 in. long. Radlk. *l. c.* 646. *Cupania fuscescens*, Miq. Fl. Ind. Bat. Vol. I, pt. 2, 567; *C. Helferi*, Hiern in Hook. fil. Fl. Br. Ind. I, 679.

Selangor: Ridley, No. 1916. Perak: King's Collector, No. 2689; Scortechini.—Distrib. British India: Sylhet, Wall. Cat. 8018, 9035. Burma: Griffith, 987; Helfer, 982/1.

2. Mischocarpus sundiacus, Blume Bijdr. 238; Rumphia III, 167. A tree 25 to 50 feet high; young branches slightly puberulous or glabrous. *Leaves* 6 to 10 in. long, equally or unequally pinnate; *leaflets* 3 to 6, elliptic-oblong or oblong-lanceolate, sub-acuminate, cuneate and sometimes slightly oblique at the base: both surfaces glabrous, shining and very minutely reticulate; the lower paler, foveolate in the axils of the 8 to 10 pairs of faint ascending curving main nerves: length 2·5 to

6 in., breadth 1·5 to 2 in., petiolules ·15. *Panicles* of a few racemose branches on which the flowers are arranged as shortly stalked cymes, slightly puberulous. *Fruit* ·25 in in diam. truncately pyriform, boldly 3-angled, crowned by the short style and narrowed at the base into a thin pseudo-stalk longer than itself, pedicel ·15 in. long. *Cupania Lessertiana*, Camb. Mèm. Mus. XVIII, 46 t. 3; Hasskarl Pl. Jav. Rar. 285; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 566; Hiern in Hook. fil. Fl. Br. Ind. I, 678; Radlk. *l. c.* 646. *Molinaea ?* Wall. Cat. 8092.

Singapore: Wallich. Malacca: Maingay, No. 438; Ridley, No. 1908. Perak: King's Collector, Nos. 4186, 7265; Scortechini, Nos. 953, 1458. Andamans: King's Collector. Penang: Curtis, No. 2433.—DISTRIB. Burma (Helfer, No. 991): Assam. Khasia, Chittagong.

This species differs very little from *M. fuscescens*. It has, however, a less pubescent inflorescence, three petals are often present in the flowers, and the fruit is sharply 3-angled. The young branches in this are puberulous, whereas those of *M. fuscescens* are quite glabrous.

The fruit of this while young is sharply 3-angled; but as it ripens the angles become obliterated and it closely resembles that of *M. Sumatranus* and *M. fuscescens*. This species may, however, be distinguished from these by its smaller leaflets with fewer nerves.

3. MISCHOCARPUS SUMATRANUS, Blume, Rumphia III, 168. A tree 30 to 50 feet high: all parts except the inflorescence glabrous. *Leaves* 5 to 12 in. long, with angled rachises: *leaflets* 4 to 8, elliptic-oblong, sub-acuminate, the base cuneate, both surfaces minutely reticulate and shining; main nerves 9 to 12 pairs, curved, the secondary almost as prominent; length 4 to 8 in., breadth 1·15 to 2·25 in., petiolules ·2 to ·25 in. *Panicles* as in *M. fuscescens*. *Petals* 0. *Fruit* pyriform, ·3 in. in diam., not angled, pseudo-stalk shorter than the fruit and also than the pedicel, pedicel ·2 in. Radlk. *l. c.* 646. *Cupania sumatrana*, Miq. Fl. Ind. Bat. Vol. 1, pt. II, 566; Hiern in Hook. fil. Fl. Br. Ind. I, 678.

Perak: Scortechini, Nos. 97, 484; King's Collector, Nos. 3933, 5278, 5391; 5397, 5727, 8307, 8329, 8374, 8403.

This is very closely allied to *M. fuscescens* which differs in having 5 minute caducous petals. In all other respects the two agree; and, in my own opinion they ought not both to rank as species. I keep both up however out of deference to Radlkofer whose monograph is a signal example of careful work.

15. LEPIDOPETALUM, Blume.

Small trees with 2- to 4-jugate pinnate leaves, the leaflets ovate-lanceolate, entire. *Racemes* axillary, a few inches long, or thyrsiform. *Sepals* 4, united at the base, valvate. *Petals* 4, smaller than the sepals,

each with one large scale connate to its margins. *Stamens* 8, the filaments glabrous. *Ovary* 2-celled, with a solitary ovule in each cell. *Fruit* capsular, coriaceous, obovate, compressed, 2-celled, reddish-brown when ripe, pericarp fleshy, the endocarp bright scarlet. *Seed* black with a mucilaginous coating and a basilar pink fleshy cupular arillus.—Distrib. 6 species from the Nicobars, Sumatra, Philippines and New Guinea.

Lepidopetalum Jackianum, Radlk. in Sitzb. Bayer. Acad. IX, 623. A small tree: young branches puberulous, soon becoming glabrous. *Leaves* 6 to 12 in. long; *leaflets* 2 to 10, sub-alternate, oblong or ovate-oblong, sub-acuminate, the base rounded or cuneate, both surfaces quite glabrous and finely reticulate; main nerves 7 or 8 pairs, bold beneath, spreading: length 3 to 5 in., breadth 1·15 to 2 in., petiolules ·15 in. *Racemes* under 2 in. long. *Flower-buds* oval, pointed; sepals lanceolate. *Petals* less than a third of the size of the sepals and alternate with them. *Stamens* short, inserted at the base of the ovary, filaments glabrous; *anthers* hirsute, oblong. *Capsule* not lobed, coriaceous, compressed, obovate, glabrous outside, hairy inside, minutely apiculate, 1·25 in. long and about ·8 in. broad, pedicel ·25 in. long. *Seed* solitary, black; arillus pale pink or white, viscous. *Cupania Jackiana*, Hiern in Hook. fil. Fl. Br. Ind. 1, 678. *Connarus? Jackianus*, Wall. Cat. 8552. Prain in Proceed. As. Soc. Beng. 1891, p. 167.

Nicobar Islands; Jack, Kurz, Prain. Batti Malv, Prain.

Dr. Prain has given in the *Journal* above quoted an excellent account from the living plant of this previously little known species, and from his description mine is largely taken.

16. Paranephelium, Miquel.

Trees with alternate exstipulate unequally pinnate leaves: *leaflets* opposite or sub-opposite. *Flowers* panicled, regular, hermaphrodite (or polygamous?) 4–6-merous. *Calyx* deeply lobed, the lobes slightly imbricate. *Petals* usually 5, small, each bearing a single scutiform scale larger than itself (the two forming a pouch). *Disc* deeply excavated, entire. *Stamens* 6 to 10, the filaments subulate, glabrous; the *anthers* short, 2-celled, basifixed. *Ovary* 3-celled, obtusely 3-angled. *Fruit* a ligneous 3-valved capsule, externally tubercled, lobulate or spinose, imperfectly 3-celled, 1- to 3-seeded. *Seed* large, angled, partly covered by a thin arillus. *Cotyledons* fleshy, oily, conduplicate.—Distrib. Malaya and Burma, 3 or 4 species.

Leaflets entire, fruit lobulate ... ... 1. *P. nitidum.*
Leaflets serrate, fruit echinate ... ... 2. *P. macrophyllum.*

Hiern's genus *Scyphopetalum* (1875) is exactly the same as *Para-*

nephelium which dates from 1860. Miquel's genus *Mitdea* (published in 1867), appears also to be reducible to this. The still older genus of *Compositae* bearing the name *Paranephelius*, Poepp. et. Endl. dates from 1842: but it has been found to be reducible to *Liabum*, Adans.

1. PARANEPHELIUM NITIDUM, King n. sp. A tree 40 to 60 feet high: young branches slender, terete, glabrous, lenticellate. *Leaves* 15 to 18 in. long, their rachises grooved: *leaflets* 5 to 9, coriaceous, oblong-lanceolate or oblong-oblanceolate, bluntly acuminate, entire, much narrowed to the base; both surfaces glabrous and shining; main nerves 14 to 16 pairs, curving, slightly prominent beneath; length 4·5 to 6·5 in., breadth 1·5 to 1·75 in., petiolules ·25 in. *Panicles* axillary, 3 or 4 in. long, few-branched, very lax; the ultimate branchlets few-flowered, cymulose. *Flowers* ·2 in. in diam., the style long-projecting, *ovary* rusty-pilose; stigmas 3, short, recurved. *Fruit* woody, depressed-globular, the surface deeply and irregularly lobulate, shortly apiculate, covered with brown scurf, 3-seeded; depth ·75 in., breadth 1 in. (unripe).

Perak: King's Collector, Nos. 7410, 7416.

2. PARANEPHELIUM MACROPHYLLUM, King n. sp. A tree 20 to 40 feet high: all parts except the inflorescence glabrous. *Leaves* 18 to 30 in. long, the rachises terete; *leaflets* 5 to 9, sub-opposite, coriaceous, oblong, shortly and abruptly cuspidate, the edges with few remote serrations, cuneate at the base; main nerves 18 to 28 pairs, spreading, depressed on the upper and prominent on the lower surface; length 6 to 15 in., breadth 2·5 to 4·5 in.; petiolules ·35 in., stout. *Panicles* pubescent, axillary, erect, few-branched, about 12 in. long, the ultimate branchlets cymose. *Flowers* ·2 in in diam. *Stamens* 8, inserted on the edge of the cupular glabrous lobulate disc. *Ovary* sub-globular, rusty-pilose. *Fruit* globular, woody, the whole surface covered with thick spines, 3-celled, 1–3-seeded; diam. to end of spines 1 to 1·5 in. (unripe).

Perak: Scortechini; King's Collector, Nos. 3157, 3204, 6436, 7027 Wray, No. 2675.

17. DODONÆA, Linn.

Shrubs rarely trees. *Leaves* simple (in the only Malayan species) alternate, exstipulate. *Inflorescence* lateral and terminal. *Flowers* polygamous, inconspicuous, *Sepals* 5–2, imbricated or valvate. *Petals* 0. *Stamens* 10–5, usually 8, inserted on the outer side of the disc; *filaments* short; *anthers* linear oblong. *Disc* obsolete in the male flower, small in the female. *Ovary* 3–6-sided and -celled; *style* 3–6-sided, its apex 3–6-cleft. *Ovules* 2 together, collateral or superposed. *Capsule* compressed, membranous, septicidally 2-valved; *valves* winged at the

back; *cells* 1–2-seeded. *Seeds* lenticular or subglobose, compressed, exalbuminous, exarillate, funicle thickened; *embryo* spirally involute.—Distrib. A genus of about 65 species mostly endemic in Australia.

Dodonæa viscosa, Jacq. Enum. Pl. Carib. 19. A shrub or small tree: the leaves simple, oblanceolate, sub-acute or very shortly apiculate, with sub-entire revolute margins, much narrowed to the base, both surfaces shining and sub-viscid; main nerves faint, numerous; length 1·75 to 4 in., breadth ·5 to 1·25 in., petiole ·1 in. *Flowers* ·25 in. in diam., in short few-flowered axillary spreading cymes. *Sepals* oblong, about ·1 in. long as are the stamens. *Capsule* membranous, compressed, with a broad marginal wing notched at base and apex, about ·75 in. long and slightly broader. Linn Mant. 228; Hiern in Fl. Br. Ind. I, 697; Kurz For. Flora Burma I, 287; Baker in Oliv. Fl. Trop. Afr. I, 433; Benth. Fl. Austral. I, 475; Brand. For. Fl. 113: Boiss. Fl Orient. I, 953. *D. angustifolia*, Linn. f. Suppl. Pl. 218; Roxb. Fl. Ind. II, 256. *D. dioica*, Roxb. Hort. Beng. 28; Fl. Ind. II, 256; Miq. Fl. Ind. Bat. Vol. I. pt. 2, p. 580. *D. Burmanniana*, DC. Prodr. I, 616; Wight Ill. I, t. 52; W. & A. Prodr. 114; Grah. Cat. Bomb. Pl. 30; Dalz. & Gibs. Bomb. Fl. 36; Thwaites Enum. 59; Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 580. *D. microcarpa*, DC. Prodr. I, 617. *D. Wightiana*, Blume Rumph. III, 189. *D. pentandra*, Griff. Notul. IV, 548. *D. heterophylla*, Hortul. ex G. Don. Gen. Syst. I, 674; Wall Cat. 8081. *Ptelea viscosa*, Linn. Sp. Pl. ed. I, 118; Burm. Fl. Ind. 36. *D. spathulata*, Sm. in Rees Cycl. XII, n. 2. *D. arabica*, Hochst. & Steud. in Herb. Arab. Schimp. n. 766. —Burm. Fl. Zeyl. t. 23. Rumph. Herb. Amboin. IV, t. 50.

In all the provinces; but usually planted.—Distrib. Warm countries generally.

18. Harpullia, Roxb.

Erect trees. *Leaves* alternate, exstipulate, pinnate; *leaflets* alternate, entire, acuminate, sub-glabrous. *Flowers* dioecious or polygamous, in racemes or panicles, regular. *Sepals* 4–5, erect, equal, imbricated. *Petals* 4–5, narrowly obovate, exceeding the calyx, sometimes clawed, without either glands or scales, but sometimes with inflected lobes at the base of the lamina. *Stamens* 5–8, inserted within the obscure disc. *Ovary* pubescent, ellipsoidal or oblong, 2-celled; *ovules* usually 2 together, superposed. *Style* elongated; *stigma* linear, usually more or less twisted. *Capsule* coriaceous, inflated, 2-lobed, 2-celled, loculicidally 2-valved; *cells* 1–2-seeded. *Seeds* sub-globose, exalbuminous, usually arillate.—Distrib. About 6 species, tropical Asiatic, Australian and Madagascarian.

Harpullia cupanioides, Roxb. Hort. Beng. 86; Fl. Ind. ed.

Wall. II, 442: ed. 1832 I, 645. A tall tree: young parts minutely tawny, puberulous. *Leaves* 12 to 18 in. long, the rachises slightly puberulous; *leaflets* 6 to 12, opposite or alternate, oblong to elliptic-lanceolate, acute or shortly acuminate, the base obliquely cuneate, both surfaces glabrous; main nerves 8 to 12 pairs, curving upwards, puberulous or glabrous: length 2·5 to 8 in., breadth 1·35 to 2·75 in., petiolule ·15 in. *Panicles* with few short branches, terminal or axillary, puberulous. *Flowers* large, ·3 in. in diam. *Sepals* 5, free, unequal, broadly oblong or sub-rotund, minutely pubescent outside. *Petals* 5, narrower than the sepals but longer. *Stamens* 5, shorter than the petals, the anthers oblong. *Disc* small puberulous. *Ovary* broadly ovoid, compressed, grooved, pubescent; *style* short, reflexed; *stigma* small, 2-lobed. *Fruit* capsular, broadly reniform, compressed, 2-lobed, glabrous *Seed* semioval, the aril orange-coloured and covering the whole seed. Hiern in Hook. fil. Fl. Br. Ind. I, 692; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 570: Kurz For. Flora Burma, I, 287: Wall. Cat. 8078. *Harpullia rupestris*, Bl. Rumphia, III, 175. *H. fruticosa*, Bl. *l. c.* 179. *H. fraxinifolia*, Bl. *l. c.* 176. *H. thanatophora*, Bl. *l. c.* 178. *Streptostigma viridiflorum*, Thwaites in Hook. Kew Journ., VI, 298, t. 9.

Perak: King's Collector, Nos. 1015, 7074; Scortechini. Andamans: King's Collector.

19. Turpinia, Vent.

Trees or shrubs with glabrous and shining leaves, and smooth terete branches. *Leaves* opposite, stipulate, usually odd-pinnate; *leaflets* opposite, stipellate, serrulate, sub-coriaceous. *Panicles* terminal and axillary; *flowers* small, regular, hermaphrodite. *Calyx* 5-partite, imbricated. *Petals* 5, imbricated. *Stamens* 5, inserted outside the lobed or crenulate raised disc; *filaments* flattened; *anthers* short. *Ovary* sessile, 3-lobed and -celled; *styles* 3, combined or distinct; *stigmas* sub-capitate; *ovules* 2 together or more and then in two rows. *Fruit* sub-globose, indehiscent, 3-celled. *Seeds* angular; *testa* hard, shining; *hilum* large; *albumen* fleshy; *aril* 0. *Embryo* straight.—Distrib. About ten species in sub-tropical Asia and America.

Turpinia pomifera, DC. Prod. II, 3. A tree 30 to 40 feet high, all parts glabrous. *Leaves* stipulate, 8 to 15 in. long, mostly unequally pinnate; *leaflets* 5 to 10, thinly coriaceous, oblong or oblong-lanceolate, shortly acuminate, the edges serrate, the base cuneate; main nerves 5 or 6 pairs, remote, ascending; length 2·5 to 8 in., breadth 1 to 3 in., petiolules of the lateral leaflets ·25 to ·35 in., of the terminal one varying from 1 to 2 in.; stipules interpetiolar or triangular, caducuous. *Panicles* spreading, shorter than the leaves; the branches diverging, brac-

teolate at the base, puberulous. *Flowers* numerous near the ends of the branches, ·15 in. in diam., greenish-white. *Calyx* with 5 deep oblong obtuse lobes, puberulous or glabrescent. *Petals* oblong, longer than the calyx, puberulous. *Stamens* about as long as the petals, the filaments glabrous. *Ovary* broadly ovoid, furrowed, almost separable into 3 loculi, glabrous, tapering into the stout stylar column. *Fruit* globose, with fleshy smooth pericarp, slightly trigonous. 3-celled, 3-seeded. Miq. Fl. Ind. Bat. Vol. I, pt. 2, 593; Hiern in Hook. fil. Fl. Br. Ind. I, 698: Kurz For. Flora Burma I, 292; Wall. Cat. 4276. *Dalrymplea pomifera*, Roxb. Hort. Beng. 17; Cor. Pl. t. 299; Fl. Ind. I, 633. *T. nepalensis*, Wall. Cat. 4277; W. and A. Prodr. 156; Wight Ic. t. 972; Bedd. Fl. Sylv. t. 159; Thwaites Enum. 71. *T. microcarpa*, W. and A. Prodr. 156. *T. martabanica*, Wall. Cat. 4278. *T. latifolia*, Wall. Cat. 4939. *Canarium Sajiga*, Ham. ex W. and A. Prodr. 175.—Wall. Cat. 8104.

Perak: King's Collector. No. 4243.—Distrib. Java, Sumatra. British India.

Var. *sphaerocarpa*, King. *Leaflets* broadly ovate or ovate-rotund, only slightly and shortly acuminate. *Panicles* often longer than the leaves. *Fruit* not more than about ·5 or ·6 in. in diam., depressed. *Turpinia sphaerocarpa*, Hassk. Cat. Hort. Bot. Bogor. 228; Flora Vol. XXV (1842), Bibl. II, p. 42; Miq. Fl. Ind. Bat. Vol. I, pt. II, 593. *Turpinia latifolia*, Wall. Cat. No. 4939. *Dalrymplea javanica*, Hassk. Pl. Jav. Rar. 439.

In all the provinces except the Andamans and Nicobars.

This is the common form in the Malayan Provinces.

Order XXXV.—Sabiaceæ.

Climbing or erect shrubs or erect trees, glabrous or with simple hairs. *Leaves* alternate, exstipulate, simple or compound. *Flowers* small or minute, hermaphrodite or polygamous, usually panicled. *Calyx* 4–5-partite, imbricate. *Petals* 4–5, equal or unequal, opposite or alternate with the sepals, imbricate. *Disc* usually small, annular. *Stamens* 4–5, opposite the petals, inserted at the base of or on the disc, all perfect or two only perfect and three without anthers; *filaments* clavate, flattened or subulate; *anthers* didymous, cells distant bursting transversely or by a deciduous cap. *Ovary* 2–3-celled, compressed or 2–3-lobed; *styles* 2–3, free or connate, or 0, stigmas punctiform; *ovules* 1–2 in each cell. *Ripe carpels* 1–2, dry or fleshy, indehiscent. *Seeds* compressed or globose, basilar, hilum broad, testa membranous or coriaceous. albumen 0; *embryo* various, cotyledons often contorted, radicle deflexed. Distrib. A small chiefly Indian order, with 4 genera and about 35 species,

Stamens 4–5, all perfect and equal	1. SABIA.
Stamens 5, very unequal	1. MELIOSMA.

1. SABIA, Coleb.

Climbing or sarmentose shrubs; branches with the bud-scales persistent at their bases. *Leaves* quite entire. *Flowers* axillary, solitary, cymose or panicled, usually hermaphrodite, 2-bracteate; bracts, calyx, corolla, stamens and carpels all opposite *Calyx* 4–5-partite. *Petals* 4–5, with transparent lines, green, purplish or yellow. *Disc* annular, 4–5-lobed. *Stamens* 4–5, inserted at the base of the disc; *anthers* extrorse or introrse. *Carpels* 2, rarely 3, cohering slightly: *styles* 2, erect, terminal, cohering slightly; *ovules* 2 in each carpel, collateral or superposed, horizontal. *Ripe carpels* 1 or 2, gibbous, with a sub-basal style, dry or drupaceous. *Seed* reniform, testa coriaceous, dotted; *embryo* curved, cotyledons straight or incurved, flat, rugose or undulate, radicle cylindric.—DISTRIB. About 16 species, natives of tropical and temperate India.

Flowers solitary, axillary	1. *S. sumatrana.*
Flowers in racemes or panicles	2. *S. limonacea.*

1. SABIA SUMATRANA, Blume Mus. Bot. Lugd. Bat. I, 370. A woody climber: young shoots with cinereous bark, sub-glabrous. *Leaves* ovate-lanceolate to elliptic, acuminate, entire, the base cuneate; upper surface glabrous, the lower minutely puberulous and sub-lepidote; main nerves about 5 pairs, much curved, the reticulations wide; length 3·5 to 7 in., breadth 1·25 to 3·5 in., petiole ·35 to ·75 in. *Peduncle* solitary, axillary, ·35 in. long (longer in fruit). *Sepals* broadly triangular, pubescent at the edges. *Petals* much longer than the sepals, lanceolate, glabrous. *Stamens* nearly as long as the petals, but shorter than the cylindric glabrous style. *Fruit* compressed, obliquely ovoid, glabrous, when ripe bright blue with dark spots. Miq. Fl. Ind. Bat. Vol. I, pt. 2, 619.

Perak: Scortechini; King's Collector, Nos. Nos. 2117, 5053, 8205. DISTRIB. Sumatra.

2. SABIA LIMONACEA, Wall. Cat. 1000. A lofty climber: young branches slender, glabrous. *Leaves* coriaceous, oblong or lanceolate, acute or acuminate, entire; the base cuneate, rarely rounded; both surfaces glabrous, the upper shining and reticulate, the lower paler and tesselate-reticulate; main nerves 5 or 6 pairs, curved, faint; length 2·5 to 6 in., breadth 1 to 1·75 in.; petiole ·6 in. *Flowers* ·15 in. in diam., in axillary or slightly supra-axillary racemes or racemoid panicles usually shorter than the leaves, glabrous; *pedicels* longer than the flowers. *Sepals* 5, green, oblong, blunt. *Petals* 5, larger than the sepals,

obovate. *Stamens* included, the filaments clavate, the anthers short with broad connective. *Fruit* solitary or paired, compressed, obliquely orbicular or elliptic, ·5 in. long. Hook. fil. and Thoms. Fl. Ind. I, 210; Hook. fil. Fl. Br. Ind. II, 3. *Celastrina*, Wall. Cat. 9015; *Sabia sp.* Griff. Notul. IV, 423; Ic. Pl. As. t. 528. p. 2.

Penang: Curtis, Nos. 1221, 2158. Perak: Scortechini, No. 628.—Distrib. British India; at the base of the Eastern Himalayan and Assam Range; Chittagong.

Sabia viridissima, Kurz in Journ. As. Soc. Bengal, Vol. XLI, Pt. 2, (1872), p. 304, is, as Kurz's type specimens in the Calcutta Herbarium clearly prove, a mixture of *Erythropalum scandens*, Blume, and an undescribed species of *Blachia* which I propose to name *B. viridissima*.

2. Meliosma, Blume.

Trees or shrubs, pubescent or glabrous. *Leaves* simple or unequally pinnate; *leaflets* sub-opposite, the terminal one rarely wanting. *Flowers* in branched terminal or terminal and axillary panicles, small or minute, hermaphrodite, rarely unisexual; bracts caducous. *Bracteoles* and *sepals* 5–9, persistent, forming an uninterrupted whorl round the petals. *Petals* 5; 3 large, nearly orbicular, valvate; 2 smaller, interior, placed behind the fertile stamens, either membranous and nearly free or reduced to a bifid scale adnate to the filament. *Stamens* 5; 2 fertile, opposite the smaller petals; filament short, flattened, incurved, expanded at the top into a cup which bears two globose cells that burst transversely, springing back elastically; 3 deformed, broad, opposite the larger petals, 2-fid with 2 empty cells, together forming a cup over the pistil. *Disc* cupular or annular, with 2–5 simple or dentate teeth. *Ovary* sessile, 2- rarely 3-celled, contracted into a simple or 2-partible style, stigma simple; *ovules* 2 in each cell. *Drupe* small, oblique, sub-globose; *stone* crustaceous, 1-celled, with usually a basilar rounded projection over which the seed is curved. *Seed* globose, testa membranous; *cotyledons* conduplicate, radicle incurved.—Distrib. Species about 32; natives of Tropical Asia and Malay Archipelago, with a few in S. America.

Leaves simple.

Petals 5; flowers ·05 in. in diam. ... ... 1. *M. elliptica.*

Petals 0; flowers ·1 in. in diam. ... ... 2. *M. lancifolia.*

Leaves pinnate.

Leaflets quite glabrous.

A shrub; leaves 12 to 18 in. long; leaflets 7 to 13; main nerves 7 to 10 pairs ... ... 3. *M. nitida.*

A tree; leaves 30 to 40 in. long; leaflets 21 to 25; main nerves 14 to 16 pairs ... ... 4. *M. levis.*

Leaflets hairy, especially on the under surface.
Flowers in clusters, sessile, buds globose ... 5. *M. lanceolata.*
Flowers solitary, shortly pedicelled, buds oblong ... ... 6. *M. Ridleyi.*

1. Meliosma elliptica, Hook. fil. Fl. Br. Ind. II, 5. A tree 20 to 40 feet high; young branches, petioles, the midribs of the leaves on both surfaces, and the lower surface especially on the nerves densely rusty-pubescent or tomentose. *Leaves* elliptic or oblanceolate, shortly caudate-acuminate, the edges entire or remotely serrate, gradually narrowed from above the middle to the petiole: upper surface glabrous except the midrib and puberulous nerves; main nerves about 10 pairs, curving upwards, the transverse veins distinct; length 4 to 9 in., breadth 1·25 to 3 in.; petiole ·5 to 1·5 in. *Panicle* terminal, usually on rather a long peduncle, longer than the leaves, the branches rather few and short. *Flowers* crowded, sessile, ·05 in. in diam. *Bracteoles* pubescent. *Sepals* 4, sub-coriaceous, orbicular, very concave, shining, sub-ciliolate. *Petals* 5, darker in colour than the sepals but of similar shape, thick, opaque and dotted, glabrous. *Fertile* stamens 2 to 4. *Fruit* sub-globular, ridged, sub-gibbous at the base, glabrous, ·2 to ·25 in. in diam. *Sabia floribunda*, Miq. Fl. Ind. Bat. Suppl. 521.

Malacca: Griffith, No. 1025; Maingay, Derry. Perak: King's Collector, Nos. 4051, 5468, 5469, 6150, 8103, and 10659.—Singapore. Distrib. Sumatra.

This is closely allied to *M. simplicifolia* which has however its flowers in ultimate cymlets of 3, whereas in this the flowers are single. The sepals moreover in *M. simplicifolia* are thinner and more pubescent than in this. As a rule the leaves in this species are quite entire; but in several of the Perak specimens they are coarsely serrate, without in any other respect departing from the typical form.

2. Meliosma lancifolia, Hook fil. Fl. Br. Ind. II, 5. A tree: young branches petioles and inflorescence rusty-villous. *Leaves* thinly coriaceous, oblanceolate, acuminate, entire, gradually narrowed from above the middle to the petiole; both surfaces distinctly reticulate, the upper shining, glabrous except the tomentose midrib and nerves; lower villous on the midrib and nerves, otherwise with scattered hairs; main nerves 20 to 24 pairs, spreading, curved, interarching freely; length 12 to 18 in., breadth 3·5 to 4 in., petiole ·75 in. *Panicle* shorter than the leaves, pedunculate, the branches few and short and the flowers sessile and crowded. *Flowers* about ·1 in. in diam.; bracteole oblong, pubescent, shorter than the 4 ovate glabrous sepals: *petals* 0, fertile; *stamens* 2 or 3, shorter than the sepals. *Ovary* elliptic; *style* short, terminal. *Fruit* transversely ovoid-globose, keeled, glabrous, ·3 in in diam.

Malacca: Maingay, No. 463/2. Perak: Scortechini.

3. Meliosma nitida, Blume Cat. Hort. Bot. Bogor. 32; Rumphia, III, 202, t. 169 A shrub or small tree: young branches glabrous, lenticellate. *Leaves* 12 to 18 in. long, unequally pinnate, quite glabrous, the rachises deeply channelled on the upper surface; *leaflets* coriaceous, 7 to 13, opposite or alternate, elliptic-ovate or obovate-lanceolate, acute or shortly acuminate, entire, the base more or less cuneate, rarely rounded; both surfaces quite glabrous, the lower paler and prominently reticulate; main nerves 7 to 10 pairs, spreading, curving upwards, interarching at some distance from the margin; length 4 to 12 in., breadth 1·75 to 4·25 in.; petiolules ·35 to ·75 in. *Panicles* terminal or axillary, rather shorter than the leaves, scurfy-puberulous, the branches short and the flowers densely crowded. *Flowers* ·1 in. in diam., shortly pedicelled; the buds pointed, the bracteole single and coriaceous. *Sepals* 4, sub-rotund, concave, spreading. *Petals* 5; the 3 outer rotund, valvate, the sutures of their edges prominent; the two inner completely enclosed, small, each with a stamen opposite it. *Stamens* 2; the hooded anther broad, expanded and with two rotund diverging lobes separated by a wide connective, the filament tapering to a narrow base. *Ovary* ovoid. *Fruit* obliquely elliptic when young, slightly flattened on one side and keeled on the other; when ripe ovoid-rotund, about 1 in. long and ·8 in. in diam. Blume Rumphia III, 202. t. 169; Miq. Fl. Ind. Bat. I, pt. 2. 617. *Meliosma Sumatrana*, Hook. fil. Fl. Br. Ind. II, 6. *Millingtonia sumatrana*, Jack in Mal. Misc. II, 39; Nees in Flora for 1825, 106; Miq. Fl. Ind. Bat. *l. c.* *Irina integerrima*, Blume Bijdr. 231.

Malacca: Griffith, Maingay, No. 461. Penang: Curtis, No. 2836. Perak: (very common) King's Collector.—Distrib. Sumatra.

Meliosma levis, King n. sp. A tree 40 to 50 feet high: *leaves* 30 to 40 in. long; the rachises and petioles puberulous and terete, the latter swollen at the base; *leaflets* 10 to 12 pairs, coriaceous, narrowly oblong-lanceolate, caudate-acuminate; the edge entire, recurved when dry, the base rather abruptly cuneate: both surfaces glabrous; the upper dull, opaque, olivaceous when dry, the lower pale brown, tesselate-areolate; main nerves 14 to 16 pairs, spreading, curving, interarching far from the edge: length 5 to 7 in., breadth 1 to 1·25 in.; *petiole* ·35 in. *Panicles* about as long as the leaves with lax raceme-like branches, sparsely covered with very short coarse rusty hairs. *Flowers* less than ·1 in. in diam., sessile on very short woody lateral branchlets; *bracteoles* two, unequal, broadly oblong, pubescent. *Sepals* 2, sub-orbicular, concave, erect, thick, puberulous outside. *Petals* 5; the three outer larger than the sepals, very concave, glabrous, the two inner small and irregular. *Stamens* 2, or sometimes 3, the anther with wide hooded connective. *Fruit* unknown.

Perak: King's Collector, No. 7893.

This is allied to *M. lanceolata*, Bl., but it appears to me to differ from that and from every other described species. From *M. lanceolata* it is readily distinguished by its more numerous perfectly smooth leaflets tesselate-reticulate beneath; by its flowers on short ultimate branchlets; by its double bracteole and concave petals.

5. MELIOSMA LANCEOLATA, Blume Cat. Hort. Bot. Bogor. 32; Rumphia III, 203, t. 168. A tree: young branches stout, more or less covered with short deciduous rusty tomentum. *Leaves* 12 to 24 in. long; the petiole stout, terete, swollen at the base, the rachis glabrescent or puberulous; *leaflets* 6 to 8 pairs with one odd, very coriaceous, oblong, shortly acuminate; the edges entire, recurved when dry: the base rounded or slightly cuneate, sometimes oblique; upper surface smooth and shining, usually very rugulose from the depression of the nerves and reticulations: lower surface dull, the midrib nerves and reticulations very prominent and with numerous flexuose sub-adpressed hairs: length 3 to 6 in., breadth 1·25 to 2 in.; petiolules ·2 to ·35 in. long, stout, pubescent. *Panicles* very large, with long raceme-like branches, rusty-pubescent. *Flowers* in rather close clusters, sessile, ·1 in. in diam.; bracteole single. *Sepals* 3, orbicular-triangular, blunt, sub-glabrous. *Petals* 5; the three outer orbicular, flat and much larger than the sepals; the two inner small, irregular, shorter than the stamens. *Stamens* 2, shorter than the outer petals, the anthers very broad. *Fruit* sub-globular, compressed, boldly keeled, glabrous, ·3 in. in diam. Hook. fil. Fl. Br. Ind. II, 7.

Malacca: Griffith, No. 1022; Maingay, No. 361; Derry, Nos. 21 and 1122. Singapore: Ridley, Nos. 347, 1892, 3876.

Var. *pubescens*, Hook. fil. Fl. Br. Ind. II, 7. Under surfaces of the leaves and inflorescence densely and softly rusty-tomentose: fruit ·4 in. in diam.

Singapore: Ridley, No. 6341.

6. MELIOSMA RIDLEYI, King n. sp. A medium tree: *leaves* 15 in. or more in length, their rachises densely and minutely rufous-tomentose: *leaflets* 11 to 15, opposite or alternate, thinly coriaceous, oblong or oblong-lanceolate, shortly acuminate, the base abruptly and obliquely cuneate; upper surface not rugulose, sparsely adpressed-pubescent, the midrib and nerves tomentose: under surface minutely rufous-pubescent, the midrib and nerves with dense long shining hairs: main nerves 7 or 8 pairs, ascending, curving, the reticulations distinct: length 2·5 to 5 in., breadth ·9 to 1·2 in.; petiolules ·1 to ·2 in., tomentose. *Panicle* longer than the leaves, densely rufous-tomentose, with short branches bearing the ultimate spikes of flowers. *Flowers* solitary, oblong, not globular

even in bud, under ·1 in. long. *Bracteoles* two, unequal, ovate, acute, pubescent; pedicel of flower very short. *Sepals* 5, ovate, blunt, concave, erect, shortly ciliolate at the edges. *Petals* and *stamens* absent. *Ovary* broadly ovoid, tomentose; *style* thick, conical, glabrescent. *Fruit* unknown.

Singapore: Ridley, No. 6342.

The only specimens of this are in flower; and, the ovaries having been fertilised, the petals and stamens (as is the case in other species of *Meliosma*) have fallen off. The only specimens known are Mr. Ridley's. They were collected in the little patch of forest which forms an adjunct to the Botanic Garden of Singapore, which is one of the few pieces of the original vegetation of the island which has escaped the ravages of axe and spade. In leaf this plant is not unlike *M. lanceolata*, Bl., but the nervation and pubescence of the leaflets are different.

Note.—Besides the foregoing, there are in the Calcutta Herbarium specimens from Singapore (Herb. Ridley, without a number) of a pinnate-leaved *Meliosma*. None of these are in fruit, but there are plenty of flowers, and these closely resemble the flowers of *M. lanceolata*, Bl. The leaflets of this plant are narrowly oblong, of rather thinner texture than those of *M. lanceolata*, and their upper surfaces are not glabrous (except the pubescent midrib), and they are not at all rugulose; the under surfaces are densely covered with unequally long shining hairs.

Nat. Ord. XXXVI, Anacardiaceae.

Trees or shrubs usually with oleo-resinous often acrid juice. *Leaves* alternate (opposite in *Bouea*) simple or compound. *Flowers* small, regular, unisexual, polygamous, sometimes hermaphrodite, usually in panicles, the ultimate branchlets being cymose. *Calyx* 3–5-partite, sometimes accrescent (spathaceous in *Gluta*, calyptrate in *Melanorrhoea*.) *Petals* 3 to 5, alternate with the segments of the calyx, free, imbricate or valvate in bud, sometimes accrescent, rarely absent. *Disc* flat, cupular or annular, entire or lobed, rarely obsolete. *Stamens* equal in number to the petals, or fewer, or more numerous, often abortive, inserted beneath the disc, rarely on it: *filaments* often subulate; the anthers 2-celled, basi- or dorsi-fixed. *Pistil* in the male flower usually absent, in the female solitary, or pistils 4 or 6 and apocarpous, or 2 to 5 and syncarpous: *ovary* mostly superior (half-inferior in *Holigarna*) the loculi with a single ovule pendulous from the top of the cell or from its side, or from an ascending funicle rising from the base: *styles* 1 to 5 and free, or the stigma sub-sessile, or simple or lobed. *Fruit* superior (except in *Holigarna* and *Drimycarpus*) and drupaceous, with one cell and one seed, and sometimes with accrescent sepals or petals; or a false drupe with a 2- to 5-celled stone covered by pulp. *Seed* exalbuminous: the *embryo* straight or curved: *cotyledons* plano-convex, radicle short.—Distrib. chiefly tropical: about 430 species in 55 genera.

Sub-Order I. ANACARDIAE. Ovary 1-celled (in all the Asiatic species).

Tribe I.—*Mangiferae.* Carpels solitary, or 5 with only one fertile; style usually lateral or gynobasic, ovules pendulous, or semi-pendulous (in *Anacardium*) from a basal funicle; ovary often with a gynophore; stamens in one or more whorl, sometimes reduced to a single individual; leaves simple.

Neither sepals nor petals accrescent.

Carpels 5, rarely 4 or 6; stamens 10 ... 1. BUCHANANIA.

Carpel solitary.

Leaves opposite ... ... 2. BOUEA.

Leaves alternate.

Calyx 4–5-partite, stamens 1 to 5; drupe with succulent mesocarp, the endocarp hard and fibrous, the peduncle not enlarged ... ... 3. MANGIFERA.

Calyx 4–5-partite, stamens 8 to 10 all or only a few perfect; drupe reniform, compressed, the peduncle much enlarged ... ... 4. ANACARDIUM.

Calyx spathaceous, petals 4 to 6; torus stipitate, drupe sub-ligneous, tubercled or ridged, the endocarp leathery ... ... 5. GLUTA.

Petals accrescent.

Calyx calyptriform; stamens 5 or numerous ... ... 6. MELANORRHOEA.

Calyx 5-partite; stamens 5, drupe stalked ... ... 7. SWINTONIA.

Tribe II.—*Rhoideae.* Carpels solitary or 3 and united; styles terminal or lateral, free or connate below; ovary 1-celled; ovule solitary, rising by a short funicle from the base or from near the base of the cell, or suspended from the wall near the apex; stamens in 1 or 2 whorls; fruit drupaceous, 1-celled, 1-seeded, sometimes with the accrescent calyx-segments at its base (obscurely 2-celled in *Drepanospermum*); embryo usually curved, rarely straight: leaves simple, trifoliolate or pinnate.

Leaves simple.
Sepals accrescent, fruit sessile; flowers 4-merous, embryo straight ... ... 8. PARISHIA.
Sepals not accrescent; flowers 5-merous; stamens 6 to 10, style 1, embryo curved... 9. CAMPNOSPERMA.
Leaves pinnate; petals imbricate.
Stamens 5, alternating with 5 staminodes.
Stigma erect, 3-lobed ... ... 10. MICROSTEMON.
Stigma flat, much bent, not 3-lobed ... 11. PENTASPADON.
Stamens 4 to 10; staminodes none.
Stamens 4 to 10; styles 3; drupe solitary, small, compressed, 1-celled, 1-seeded, not crowned by the styles ... 12. RHUS.
Stamens 8 to 10; styles 3 or 4; drupe reniform, compressed, 1-celled, 1-seeded, crowned by the distant styles ... 13. ODINA.

Tribe III.—*Semecarpeae.* Ovary consisting of three united carpels, unilocular, free or immersed in and adnate to the cupular or tubular disc; ovule solitary, suspended by a funicle from the side of the loculus above its middle or just below the apex, stamens in a single row; styles 3; drupe large, usually connate with the enlarged more or less fleshy peduncle, inferior in *Drimycarpus*.
Drupe superior.
Petals valvate, stamens 5, style 1; calyx-tube persistent, much enlarged in the fruit and adnate to the base of the drupe 14. MELANOCHYLA.
Petals imbricate, stamens 5, styles 3, drupe on a much enlarged fleshy receptacle... ... ... 15. SEMECARPUS.
Drupe inferior.
Petals imbricate, stamens 5, style 1, ovary inferior, drupe transversely ovoid ... 16. DRIMYCARPUS.

Sub-Order II. SPONDIAE. Ovary and drupe 2- to 5-celled, ovules pendulous.
Flowers bisexual, 5-merous, stamens 10; styles 5, thick, connate by their apices; drupe 5-celled, sometimes fewer-celled by abortion ... 17. DRACONTOMELUM.

1. Buchanania, Roxb.

Trees. *Leaves* alternate, petioled, simple, quite entire. *Panicles* terminal and axillary, crowded. *Flowers* small, white, hermaphrodite. *Calyx* short, 3–5-toothed or -lobed, persistent, imbricate. *Petals* 4–5, oblong, recurved, imbricate. *Disc* orbicular, 5-lobed. *Stamens* 8–10, free, inserted at the base of the disc. *Carpels* 5–6, free, seated in the cavity of the disc, one fertile, the rest imperfect; *style* short, stigma truncate; *ovule* 1, pendulous from a basal funicle. *Drupe* small, flesh scanty; *stone* crustaceous or bony, 2-valved. *Seed* gibbous, acute at one end; *cotyledons* thick; *radicle* superior.—Distrib. A tropical Asiatic, Australian and Polynesian genus; species about 25.

Anthers not sagittate at the base ... ... 1. *B. platyneura.*

Anthers sagittate at the base.

Leaves always sharply acuminate at the apex, the lower surface of the midrib pubescent; panicles pubescent ... ... 2. *B. sessilifolia.*

Leaves rounded or obtuse at the apex, sometimes shortly and bluntly acuminate, everywhere glabrous: panicle glabrous ... ... 3. *B. florida.*

1. Buchanania platyneura, Kurz in Journ. As. Soc. Bengal XLV (1876), pt. 2, p. 125. A tree 40 to 60 feet high, the young shoots deciduously puberulous. *Leaves* coriaceous, narrowly elliptic to elliptic-lanceolate, shortly and bluntly acuminate, the base cuneate and sometimes slightly unequal; both surfaces glabrous and shining, the reticulations when dry distinct or not, the midrib broad on both surfaces; main nerves 11 to 13 pairs, spreading, curving; length 4 to 9 in. or even 11 in., breadth 1·75 to 2·5 in., petiole ·5 to 1 in. *Panicles* crowded at the ends of the branches, axillary, erect, shorter or longer than the leaves, shortly pedunculate, puberulous; their branches short, slender, horizontal, cymosely few-flowered. *Flowers* ·1 in. in diam., on minutely bracteolate pedicels longer than themselves. *Sepals* 4, thick, ovate or elliptic, obtuse, much shorter than the petals. *Petals* 4, oblong, very blunt, spreading and reflexed. *Stamens* 8; the anthers narrow, elongate, the bases not sagittate, the apices recurved; *filaments* longer than the anthers, flat. *Pistils* several, one only ripening. *Drupe* sub-globular, with 4 vertical ridges, two prominent and two obscure, glabrous, purplish-black when ripe; the stone hard, ·4 in. in diam. Engler in DC. Mon. Phan. IV, 193.

The Andaman and Nicobar Islands: very common.

This is put by Engler amongst doubtful species—no doubt as the result of his not having seen good specimens; for the species is a very well-marked one. Its nearest ally is the Sumatran species *B. splendens*, Miq.

2. Buchanania sessilifolia, Blume Mus. Bot. Lugd. Bat. I, 184. A shrub or small tree, the young branches puberulous and not swollen, ultimately glabrous. *Leaves* thinly coriaceous, oblanceolate, always abruptly acuminate at the apex and much narrowed to the base, either with a short petiole or sessile; the upper surface glabrous and rather dull, the lower pale-brown when dry and glabrous except often the sparsely adpressed-pubescent midrib; main nerves 13 to 15 pairs, spreading, slightly prominent on the lower surface; length 3·5 to 7 in., breadth 1·5 to 2·5 in.; petiole none or from ·1 to ·6 in. long. *Panicles* pedunculate, exceeding the leaves, slender; the branches divaricate, and with the flowers crowded towards their apices, sparsely pubescent. *Flowers* ·15 in. in diam., on short pedicels. *Sepals* 5, sub-rotund, puberulous. *Petals* 5 or 6, much larger than the sepals, oblong, blunt with the apices recurved, glabrous. *Stamens* 8 or 10: the *anthers* sagittate, the basal lobes rounded and swollen; the filaments short, thick, compressed. *Pistils* several. *Drupe* sub-cordate, rotund, compressed, glabrous, about ·35 in. long. Miq. Fl. Ind. Bat., Vol. I, pt. 2, 637; Suppl. 523; Engler in DC. Mon. Phan. IV, 191. *B. acuminata*, Turcz. in Bull. Mosc. (1858), I, 472; Hook. fil. Fl. Br. Ind. II, 24; Kurz For. Flora Burma, I, 308. *Hypericinea lucida*. Wall. Cat. 4827. *Terebinthacea*, Wall. Cat. 8505, (*fide* Hook. fil.)

In all the Provinces except the Andamans and Nicobars: very common.—Distrib. the Malayan Archipelago.

This differs from all the forms of *B. florida*, Schauer, in having more acuminate leaves of thinner texture, with the midrib pubescent on the lower surface, and with rather more numerous nerves; and also in having a pubescent panicle and larger fruit. There is considerable variation as to the petiole. In some specimens there is no petiole at all, and it is to these which Blume gave the name *B. sessilifolia*. Turczaninoff's name *B. acuminata*, being applicable to all the forms, is a far more appropriate one; and Sir Joseph Hooker adopts it although the procedure is, as he admits, "against the laws of priority:" for Turczaninoff's species was not published until 1858, whereas Blume dates from 1851.

3. Buchanania florida, Schauer in Nov. Act. Caes. Leop. Carol. XIX, Suppl. I, 481. A small glabrous tree, young branches close to the leaves, thick and with many cicatrices. *Leaves* thinly coriaceous, oblong-lanceolate to obovate-oblong, the apex rounded or obtuse; narrowed from below the middle to the broad channelled somewhat winged petiole; both surfaces shining, reticulate; main nerves about 12 pairs, the intermediate veins very distinct; length 4 to 5·5 in., breadth 1·25 to 1·75 in., petiole ·5 to ·75 in. *Panicles* crowded about the ends of the

branches, axillary, longer than the leaves, narrowed, lax, the branches short, bracteoles minute. *Flowers* on pedicels longer than themselves, ·25 in. in diam. *Sepals* 4 or 5, orbicular, slightly unequal. *Petals* 4 or 5, larger than the sepals, elliptic, obtuse. *Stamens* 8, the anthers elongate, cordate at the base; the filaments shorter, subulate. *Pistils* 3 or 4, but one only fertile. *Drupe* broadly ovoid or sub-globular, slightly compressed, about ·25 in. long. Engl. in DC. Mon. Phan. IV, 188.

Var. *lucida*, Engler *l. c.* 189: *Leaves* oblong-lanceolate, sometimes shortly and obtusely acuminate, the nerves and veins very prominent. *B. lucida*, Blume Mus. Bot. Lugd. Bat. I, 184; Hook. fil. Fl. Br. Ind II, 24; Miq. Fl. Ind. Bat. I, pt. 2, p. 637. *B. palembanica*, Blume *l. c.* 186; *B. subobovata*, Griff. Not. IV, 413. *B. polybotrya*, Miq. Fl. Ind. Bat. I, pt. 2, p. 638. *Hypericinea angustata*, Wall. Cat., No. 4830. *B. arborescens*, Blume Mus. Bot. Lugd. Bat. I, 183; Kurz For. Flora Burma, I, 308.

Penang, Kedah, Singapore, Malacca, Perak:—Distrib. Sumatra, Burma.

This, although widely distributed in the Malayan Peninsula, does not appear to be any thing like so abundant a tree as *B. acuminta*, but it is more common than the following variety.

Var. *petiolaris*, Engl. *l. c.* 189: *Leaves* obovate-oblong, contracted at the base into the long cuneate petiole. *B. petiolaris*, Miq. Fl. Ind. Bat. Vol. I, pt. 2, p. 637. *B. bancana*, Miq. Fl. Ind. Bat. Suppl. 523.

Penang: Wallich (Cat. No. 4831). Singapore: Ridley, Nos. 438, 1882.

2. Bouea, Meissn.

Trees. *Leaves* opposite, petioled, coriaceous, glabrous, quite entire. *Flowers* small, in axillary and terminal panicles, polygamous. *Sepals* 3–5, deciduous, valvate. *Petals* 3–5, vertically keeled on the inner face, imbricate. *Disc* very small. *Stamens* 3–5, inserted within the disc, all fertile. *Ovary* sessile; *style* short, terminal, stigma obscurely and unequally 3-lobed; *ovule* ascending from the wall of the cavity. *Drupe* fleshy; *stone* thin fibrous, 1-celled, 1-seeded. *Seed* suberect; *cotyledons* fleshy; *radicle* very short, inferior.—Distrib. Species 5, natives of Tropical Asia and the Malay Archipelago.

Leaves 3 to 5 in. long; panicles laxly flowered; sepals puberulous; petals oblong, erect; fruit ·6 to ·75 in. long	1. *B. burmanica.*
Leaves 5 to 8 in. long; panicles densely flowered; sepals tomentose; petals oblanceolate-oblong, spreading; fruit more than 2 in. long	2. *B. macrophylla.*

1. Bouea burmanica, Griff. Plant. Cantor. 14. A glabrous tree 50 to 60 or even 90 feet high; young branches slender. *Leaves* thinly coriaceous, oblong-lanceolate, shortly and obtusely acuminate, the base cuneate; main nerves 10 to 15 pairs, spreading, slightly depressed on the upper and slightly projecting on the lower surface; length 3 to 5 in., breadth 1 to 2 in., petiole ·25 to ·5 in. *Panicles* much shorter than the leaves, terminal or axillary, slender, with a few spreading laxly-flowered puberulous branches, bracteoles absent. *Flowers* oblong, less than ·1 in. in diam., glabrous, on pedicels longer than themselves. *Sepals* 4, unequal, leathery, broadly ovate, puberulous. *Petals* 4, very thick, erect, oblong, obtuse, longer than the sepals, quite glabrous. *Stamens* 3 to 5, shorter than the petals, the anthers linear, the filaments short. *Ovary* obliquely ovoid. *Drupe* obliquely ovoid, slightly apiculate, ·6 to 1 in long. Hook. fil. Fl. Br. Ind. II, 21; Kurz For. Flora Burma, I, 306; Engler in DC. Mon. Phan. IV, 240. *B. oppositifolia*, Meissn. in Walp. Rep. I, 556; Kurz For. Flora Burma, *l. c.* 306. *B. Brandisiana*, Kurz in Journ. As. Soc. Beng. 1871, II, 50: 1873, II, 66. *Mangifera oppositifolia*, Roxb. Fl. Ind. I, 640; Hort. Beng. 18; Wall. Cat. 8490. *Cambessedea*, W. and A. Prod. I, 170.

In all the Provinces.—Distrib. Burma.

Var. *microphylla*, Engl. in DC. Mon. Phan. IV, 240. All the parts smaller than in the type. *Bouea microphylla*, Griff. Plant. Cantor. 15; Notul. IV, 423; Hook. fil. Fl. Br. Ind. II, 21. *B. diversifolia*, Miq. Fl. Ind. Bat. Suppl. 522. *B. myrsinoides*, Blume Mus. Bot. I, 204; Miquel *l. c.* I, pt. 2, 635.

Malacca: Griffith, 1106; Maingay, 479. Singapore: Ridley; Hullett, No. 660.

2. Bouea macrophylla, Griff. Plant. Cantor. 15: Notulae, IV, 420. A tree, all parts glabrous except the inflorescence. *Leaves* coriaceous, oblong-lanceolate, the apex very shortly and bluntly acuminate, the base cuneate or rounded; both surfaces shining; main nerves 18 to 20 pairs, spreading, slightly depressed on the upper and prominent on the lower surface; length 5 to 8 in., breadth 1·65 to 2·65 in.; petiole ·75 to 1 in. *Panicles* axillary and from the axils of old leaves, 2 to 4 in. long, puberulous; their branches spreading, short, and densely flowered. *Flowers* ·1 in. in diam., on tomentose pedicels shorter than themselves. *Sepals* 3 or 4, ovate, unequal, blunt, spreading, tomentose externally. *Petals* 3 or 4, oblanceolate-oblong, rather thick, glabrous. *Stamens* 3 or 4, about as long as the sepals: *anthers* ovate, slightly longer than the filaments. *Ovary* narrowly ovoid, pubescent. *Drupe* "ovoid-oblong, as large as a hen's egg" (Griff.), pulp abundant; *stone* leathery, fibrous. Hook. fil. Fl. Br. Ind. II, 21; Engler in DC. Mon.

Phan. IV, 239. *B. Gandaria*, Blume Mus. Bot. Lugd. Bat. I, 204, (sub *B. oppositifolia*.)

Malacca : Griffith, No. 1105 ; Maingay, No. 478. Perak : Scortechini, No. 1938 ; King's Collector, No. 679.

This species has larger leaves and fruit than *B. burmanica*, and the panicles are much mere densely flowered than in that species. The calyx moreover in this is very tomentose, and the petals are narrow oblanceolate and spreading.

3. Mangifera, Linn.

Trees. *Leaves* alternate, petioled, quite entire, coriaceous. *Flowers* small, polygamous, in terminal panicles, pedicel articulate ; bracts deciduous. *Sepals* 4 or 5, imbricate, deciduous. *Petals* 4–5, free or adnate to the disc, imbricate ; nerves thickened, sometimes ending in excrescences. *Stamens* 1–5, rarely 8, inserted just within the disc, or on it, 1 usually more perfect and much larger than the others ; the others with imperfect or smaller anthers, or reduced to teeth or quite absent. *Ovary* sessile, 1-celled, oblique; *style* lateral ; *ovule* pendulous ; funicle basal, or inserted on the side of the cell above its base, rarely horizontal. *Drupe* large, fleshy ; *stone* compressed, fibrous. *Seed* large, compressed, testa papery ; *cotyledons* plano-convex, often unequal and lobed.—Distrib. tropical Asiatic, chiefly Malayan ; about 30 species.

Disc fleshy, tumid, more or less deeply 4- or 5-lobed, the petals inserted at its base.

Sepals and petals 4, stamen 1.

Panicles puberulous.

Leaves narrowly elliptic or elliptic-oblong, tapering much to each end, thinly coriaceous ; petioles 1 to 1·25 in long ... 1. *M. Griffithii.*

Leaves elliptic, sub-coriaceous, petioles ·25 to ·4 in. long ... ... 2. *M. microphylla.*

Leaves broadly elliptic, slightly obovate, thickly coriaceous ; petioles ·25 to ·75 in. long ... ... 4. *M. sclerophylla.*

Panicles quite glabrous.

Leaves not reticulate, or very indistinctly so on the lower surface only ... 5. *M. Maingayi.*

Leaves distinctly reticulate.

Leaves broadly oblanceolate or obovate-elliptic ... ... 5. *M. andamanica.*

Leaves elliptic-oblong or oblong-lanceolate.

Petioles of leaves 2 to 4·5 in. long, thickened and dilated near the base; flowers 8 to 12 on the ultimate branchlets, racemose ... 6. *M. longipetiolata.*

Petioles of leaves ·75 to 1·2 in. long, only slightly thickened at the base; flowers on the ultimate branchlets in cymules of 3 ... 7. *M. quadrifida.*

Sepals and petals 5.

Stamens 5 all fertile; panicle as in *M. indica* ... ... 8. *M. pentandra.*

Stamen 1 perfect, with or without abortive ones (staminodes).

Panicle minutely tomentose or pubescent 9. *M. indica.*

Panicle quite glabrous.

Leaves very coriaceous ... ... 10. *M. oblongifolia.*

Leaves thinly coriaceous.

Leaves oblong, or elliptic-oblong, 5 to 8 in. long, with 16 to 20 pairs of prominent main nerves; stamen longer than the petals ... ... 11. *M. longipes.*

Leaves elliptic-lanceolate, 3 or 4 in. long, with 10 to 12 pairs of indistinct main nerves; the petals shorter than the stamen ... ... 12. *M. gracilipes.*

Disc minute or absent.

Panicles glabrous (black when dry) stamens attached to the minute disc.

Leaves elliptic-lanceolate, acute or acuminate, reticulate, main nerves about 20 pairs; flowers ·25 in. long, drupe oblong... 13. *M. odorata.*

Leaves elliptic-oblong, obtuse or sub-acute, the reticulations indistinct or obsolete, main nerves 15 to 18 pairs; flowers ·35 in. in diam., disc cylindric; drupe elliptic to globose ... ... 14. *M. foetida.*

Leaves narrowly linear-oblong or linear-lanceolate, with 25 to 35 pairs of main nerves, both surfaces conspicuously reticulate; flowers nearly ·3 in. long; drupe obliquely and broadly oblong-globose ... 15. *M. fragrans.*

Panicles puberulous, flowers ·35 in. long; leaves with obtuse or rounded apices; stamens 5 or 6, all perfect ... ... 16. *M. lagenifera.*

Panicles tomentose or pubescent; petals adnate to the cylindric torus.

Flowers not more than ·3 in. long.

Leaves sessile or sub-sessile, oblanceolate or obovate-oblong, 9 to 15 in. long, panicle 20 to 30 in. long ... ... 17. *M. kemanga.*

Leaves broadly lanceolate or elliptic-oblong, shortly acuminate, 6 to 12 in. long; panicle 12 to 15 in. long. ... 18. *M. caesia.*

Flowers ·75 in. long, with large concave bracts ... ... 19. *M. superba.*

1. Mangifera Griffithii, Hook. fil. in Trans. Linn. Soc. XXII, 168. A tree with stout glabrous branches. *Leaves* thinly coriaceous, narrowly elliptic or elliptic-oblong, tapering from about the middle to each end, the apex sub-acute or very shortly and bluntly acuminate, the base cuneate, both surfaces glabrous and reticulate; main nerves about 14 to 16 pairs, spreading, slightly raised on both surfaces; length 5 to 7 in., breadth 2 to 2·5 in.; petiole 1 to 2·5 in. *Panicles* coarsely puberulous, axillary, slightly longer than the leaves, raceme-like, with very short few-flowered branches. *Flowers* less than ·1 in. long, on short pubescent pedicels. *Sepals* 4, broadly ovate, obtuse, concave, unequal, pubescent outside. *Petals* 4, a little longer than the sepals, broadly obovate, with 1 or 2 short thickened ridges near the base, glabrous. *Stamen* 1, inserted on the 4-lobed glabrous disc. *Ovary* unknown. *Fruit* oblong, slightly obovoid, obtuse, glabrous, about 1·5 in. long and greenish yellow when ripe, the pulp firm: *stone* less than 1 in. long. Hook. fil. Fl. Br. Ind. II, 14; Engler in DC. Mon. Phan. IV, 203.

Malacca: Griffith, No. 1100/1. Perak: King's Collector, No. 7539.

This species is imperfectly known as yet. The material which I have used in describing it consists of Griffith's specimens on which the species was founded, and they have only male flowers; and of some sent from Perak by the Calcutta Collector which are in fruit and have no flowers. In leaves these two sets agree absolutely, and I have no hesitation in bringing them together as belonging to the same species.

2. Mangifera microphylla, Griff. MSS. ex Hook. fil. Fl. Br. Ind. II, 17. A small tree. *Leaves* sub-coriaceous, elliptic, shortly acuminate, the base narrowed but rounded, both surfaces shining and faintly reticulate; main nerves 10 to 12 pairs, spreading but curving upwards,

slightly prominent; length 2 to 4 in., breadth 1 to 2 in.; petiole ·25 to ·4 in. *Panicles* in fascicles from the apices of the branches, shorter than the leaves, raceme-like with short few-flowered branches, puberulous. *Flowers* ·2 in. in diam., on short stout pedicels. *Sepals* 4, broadly ovate, pubescent. *Petals* 4, twice as long as the sepals, oblong, with 3 distinct vertical ridges. *Stamen* 1, staminodes absent. *Ovary* subglobose, puberulous, the style terminal. *Drupe* "oviform," green. Engler in DC. Mon. Phan. IV, 209.

Malacca: Griffith, Nos. 1102, 1103. (in orchards only.)

Another imperfectly known cultivated species of which only scraps exist in collections.

3. Mangifera sclerophylla, Hook. fil. Fl. Br. Ind. II, 15. A tree; young branches stout, angled, glabrous. *Leaves* very coriaceous, broadly elliptic, slightly obovate, the apex usually sub-acute but sometimes acute, slightly narrowed to the rounded or sub-cuneate base both surfaces glabrous, the reticulations obscure, the midrib thick; main nerves about 12 pairs, thick, spreading, much curved upwards at the ends, slightly prominent on both surfaces when dry; length 2·5 in. to ·5 in., breadth 1·5 to 2·75 in.; petioles of the upper leaves ·25 in., of the lower ·75 in., all stout. *Inflorescence* consisting of a terminal fascicle of many spikes, some of them with 1 or 2 branches, longer than the leaves, covered with short coarse tawny pubescence. *Flowers* ·1 in. in diam., each sessile in the axil of a reflexed ovate concave pubescent bracteole longer than itself. *Sepals* 4, broadly ovate, sub-acute, concave, pubescent outside. *Petals* 4, about the same size and shape as the sepals, glabrous. *Stamen* 1; disc fleshy, ovary ovoid. *Drupe* ovoid, glabrous, about 1·5 in. long when ripe. Engler in DC. Mon. Phan. IV, 205.

Malacca: Maingay, No. 494. Singapore: Ridley, No. 4772.

This is another species that is poorly represented in collections. The leaves are, as Sir Joseph Hooker justly remarks, unlike those of any other *Mangifera*; for they are comparatively broad in proportion to their length. They vary considerably in size and in the length of their petioles.

4. Mangifera maingayi, Hook. fil. Fl. Br. Ind. II, 17. A tree, glabrous in all its parts. *Leaves* coriaceous, elliptic-oblong, acute or acuminate, the base rounded or cuneate; reticulations on the upper surface not visible and on the lower very slightly so; main nerves 15 to 20 pairs, faint, spreading, curving very little; length 4 to 9 in., breadth 1·5 to 3·5 in.; petiole ·8 to 2 in. *Panicle* quite glabrous, pale green (when dry), pyramidal, equal to or rather exceeding the leaves; the branches spreading, rather slender. *Flowers* ·2 in. in diam., their pedicels slender. *Sepals* 4, ovate, obtuse. *Petals* 4, twice as

long as the sepals, oblong, with 3 to 5 confluent vertical ridges. *Stamen* 1, short; the staminodes minute, tooth-like. *Ovary* globose; the style short, subulate, sub-terminal. *Fruit* unknown. Engler in DC. Mon. Phan. IV, 208.

Malacca: Maingay, No. 472.

I have never seen this, and the foregoing description of it is compiled from Sir Joseph Hooker who makes the following note:—

"There appear to be two varieties of this in Maingay's Herbarium; one (called Sapoong or Sampong), with larger leaves not narrowed into the petiole, opaque above, with sunk nerves, tumid between the nerves; the other (marked as truly wild) with brown (when dry) more shining leaves, narrowed into the petiole, more reticulated beneath, and the nerves not sunk; its leaves are like those of *M. indica*, from which its glabrous pedicelled flowers and warted petals at once distinguish it; both differ from *M. quadrifida* in the inflorescence. The first variety has, according to Maingay, globose green fruit 3-4 by 2½-3 in."

5. MANGIFERA ANDAMANICA, King n. sp. A perfectly glabrous tree; young branches slender and with pale bark. *Leaves* drying very pale, broadly oblanceolate or obovate-elliptic, the apex rounded or obtuse, gradually narrowed from above the middle to the broad channelled petiole; both surfaces finely reticulate, shining, the lower paler: main nerves 10 or 12 pairs, curving upwards, slightly prominent on the lower surface; length 3·25 to 4·5 in., breadth 1·25 to 2 in.; petiole ·5 to ·75 in., thickened in its lower half. *Panicles* terminal, twice as long as the leaves or even three times as long, branching from the base, the branches spreading, lax, the flowers borne at the extremities of the slender ultimate branchlets. *Flowers* ·3 in. in diam., quite glabrous, on pedicels about as long as themselves; bracteoles if any deciduous. *Sepals* 4, lanceolate, slightly unequal, sub-concave. *Petals* 4, twice as long as the sepals, ovate-elliptic, with 5 sub-confluent ridges on the lower half of the inner surface. *Stamen* 1, shorter than the petals, inserted on the inner edge of the fleshy deeply 4-lobed disc. *Ovary* sub-globose: *style* sub-terminal, nearly as long as the petals. *Drupe* elliptic, glabrous, nearly 1·5 in. long when ripe, the pulp thin.

Andaman Islands: King's Collectors.

A very distinct species allied to *M. Maingayi*, Hook. fil., but with smaller more obtuse leaves and larger flowers than that species.

6. MANGIFERA LONGIPETIOLATA, King n. sp. A glabrous tree 40 to 60 feet high; young branches rather stout, with pale brown bark. *Leaves* coriaceous, oblong to elliptic-oblong, tapering to both ends, the apex shortly acuminate, gradually narrowed in the lower third to the long petiole, both surfaces pale when dry and distinctly reticulate; main nerves 16 to 20 pairs, slender, slightly prominent on both surfaces, spreading, curving, the midrib very prominent and strong on the lower

surface; length 7·5 to 10 in., breadth 2·25 to 3·75 in.; petiole 2 to 4·5 in., thickened and dilated near the base. *Panicles* quite glabrous, axillary and terminal, branching from the very base; the branches few, ascending, and with short lateral racemoid branchlets bearing 8 to 12 pedicellate flowers near their ends. *Flowers* ·15 in. in diam., their pedicels rather longer than themselves, with 1 or 2 minute bracteoles at their bases. *Sepals* 4, ovate-lanceolate, rather unequal. *Petals* 4, larger than the sepals, elliptic, thickened near the base by 3 broad vertical tuberculate ridges. *Stamen* 1, a little shorter than the petals, inserted on the obscurely lobed cupular fleshy disc, the anther elliptic. *Ovary* sub-globular with slightly lateral slender style. *Drupe* unknown.

Perak: at an elevation of about 2,500 feet; King's Collector, No. 7266.

This resembles *M. quadrifida*, Jack, but the ultimate branchlets of the panicle are longer, the flowers are more numerous and are racemose instead of being cymose as in *M. quadrifida*. The petioles moreover are longer in this, and are dilated near the base; the main nerves of the leaves are more prominent and the reticulations are larger and more distinct, while the midrib is much stouter and more prominent on the lower surface. This grows at higher elevations than *M. quadrifida*. In the great length of its petioles this resembles *M. longipes*, Griff.; but that has 5-merous flowers, whereas flowers of this are 4-merous.

7. MANGIFERA QUADRIFIDA, Jack in Roxb. Fl. Ind. ed. Carey, II, 440. A tree 40 to 60 feet high, all parts quite glabrous. *Leaves* coriaceous, elliptic-oblong or oblong-lanceolate, tapering from about the middle to the sub-acute apex and much attenuate base; reticulations faint on both surfaces, but specially on the upper: main nerves 16 to 18 pairs, spreading, curved, slightly prominent; length 5 to 7 in., breadth 1·75 to 2·5 in.; petiole ·75 to 2·5 in.; petiole ·75 to 1·2 in. *Panicles* from the uppermost axils, often crowded or terminal, exceeding the leaves, not pedunculate, branching from near the base, the branches semi-erect, with very short lax 3-flowered cymose branchlets. *Flowers* ·15 in. in diam., on pedicels about their own length. *Sepals* 4, broadly ovate, obtuse, minutely puberulous, spreading. *Petals* 4, twice as long as the sepals, elliptic, sub-acute, glabrous, with 3 confluent vertical ridges in the lower half, the middle one thickened at the apex. *Stamen* 1, from the inner side of one of the four deep lobes of the fleshy disc, shorter than the petals, the anther small. *Ovary* broadly ovoid, glabrous; the *style* terminal, as long as the stamen, thickened at the base. *Staminodes* none. *Drupe* roundish (becoming very dark-coloured, Jack). Wall. Cat. 8489; Hook. fil. Fl. Br. Ind. II, 16; Engler in DC. Mon. Phan. IV, 206.

Penang: Jack. Malacca: Maingay, No. 468. Perak: King's Collector, Nos. 2693, 8444.

I have not seen fruit of this, and nothing has been recorded about it except Jack's statement that is roundish and becomes very dark-coloured. The long, laxly-branched, quite glabrous panicles make the species easy of recognition.

8. MANGIFERA PENTANDRA, Hook. fil. Fl. Br. Ind. II, 14. A tree. *Leaves* coriaceous, oblong or oblong-lanceolate, sub-acute, the edges sub-undulate, the base slightly cuneate or almost rounded, the nerves as in *M. indica*, but the reticulations between them finer and more distinct on both surfaces; length 4 to 6 in., breadth 1·5 to 2 in.; petioles ·4 to ·6 in. *Panicles* as in *M. indica*, but more densely hairy. *Sepals* 5, broadly ovate, obtuse, coarsely pubescent outside. *Petals* slightly longer than the sepals and similar in shape, 3-nerved in front to the middle, glabrous. *Stamens* 5, much shorter than the petals, unequal, seated upon the thick lobed disc, all fertile. *Ovary* smooth, style sub-terminal. *Fruit* unknown. Engler in DC. Mon. Phan. IV, 198.

Malacca: Griffith, No. 1095: Maingay (Kew Distrib.), No. 471.

This species is very imperfectly known. Both in its leaves and inflorescence it much resembles *M. indica*, L.; but the flowers have five stamens, the sepals are broader and more coarsely pubescent, the petals are shorter and are situated nearer the edge of the disc. The bases of the leaves are also less cuneate than in *M. indica*. According to Maingay, the petals of this are yellowish-white with yellow-brown edges. The Malay name of it is, he states, "Man ploni."

9. MANGIFERA INDICA, Linn. Spec. Pl. 290. A spreading tree 20 to 30 feet high, all parts except the inflorescence glabrous. *Leaves* coriaceous, narrowly oblong, elliptic-oblong or oblong-lanceolate, usually acute or acuminate, rarely sub-acute, the margins sometimes undulate, the base cuneate; main nerves 12 to 20 pairs, spreading, curving, slightly prominent on both surfaces when dry; length 5 to 10 in., breadth 1·5 to 3 in.; petiole ·5 to 1 in. or even 2 in. *Panicles* longer than the leaves, axillary or terminal, with many spreading branches, many-flowered, minutely tomentose or pubescent, rarely glabrescent; bracteoles ovate, small. *Flowers* ·2 in. in diam., monœcious, on short thick pedicels, yellowish. *Sepals* ovate, concave, pubescent outside, shorter than the petals. *Petals* oblong, sub-acute, glabrous, the inner face with 3 stout nerves. *Stamen* 1, rising from between two of the 5 lobes of the fleshy disc, filament subulate. *Ovary* obliquely ovoid, glabrous. *Drupe* large, fleshy, obliquely pyriform or sub-ovoid, sub-compressed, varying in length from 3 or 4 in. and in some of the cultivated forms as much as 12 inches; *stone* with a fibrous coat, very hard. DC. Prod. II, 63: Blume Mus. Bot. Lugd. Bat. I, 193: Roxb. Fl. Ind. I, 641; W. and A. Prod. 170; Beddome Fl. Sylv. t. 162; Wall. Cat. 8487 (excl. D. G. and

I.); Dalz. and Gibs Bomb. Flor. 51; Bot. Mag. t. 4510; Brandis For. Flor. 125; Hook. fil. Fl. Br. Ind. II, 13: Kurz For. Flora Burma, I, 304; Engler in DC. Mon. Phan. IV, 199. *M. domestica*, Gaertn. Fruct. t. 100.—Rheede Hort. Mal. IV, t. 1, 2.

In all the Provinces, but planted; truly wild only in hot valleys in the mountain ranges of British India: known as the "Mango" to Europeans in the British India, the commonest vernacular Indian name being *Am.* An immense number of varieties are in cultivation.

10. MANGIFERA OBLONGIFOLIA, Hook. fil. Fl. Br. Ind. II, 16. A very large and perfectly glabrous tree; young branches stout. *Leaves* very coriaceous, oblong-elliptic, or linear-oblong, obtuse or sub-acute, the margins sub-undulate, the base sub-cuneate; main nerves 18 to 25 pairs, spreading, curved, reticulations faint on the upper and obsolete on the lower surface; length 8 to 12 in., breadth 1·5 to 2·5 in.; petiole 1·25 to 2 in. *Panicle* large, the branches widely spreading, bi- or tri-chotomously laxly-branched. *Flowers* ·25 in. in diam., on pedicels ·15 to ·25 in. long, stout. *Sepals* 5, ovate, obtuse, veined. *Petals* 5, twice as long as the sepals, elliptic-oblong, with 3 to 5 short vertical ridges confluent at the base into a tubercle. *Stamens* 5, all bearing anthers, but only one fertile longer than the others. *Ovary* sub-globose, style sub-terminal. *Fruit* ovoid, dull green, 4 in. long. Engler in DC. Mon. Phan. IV, 16.

Malacca: Griffith, No. 1101; Maingay, No. 470. *Cultivated.*

A species, according to Maingay, cultivated under the name of the "Quenee Mango."

11. MANGIFERA LONGIPES, Griff. Notul. IV, 419. A tree: young branches slender, glabrous. *Leaves* thinly coriaceous, oblong or elliptic-oblong, shortly acuminate, the edges minutely sub-undulate, the base narrowly cuneate, both surfaces shining; main nerves 16 to 20 pairs, sub-horizontal, thin but distinct on both surfaces (some of the intermediate towards the apex almost as distinct): length 5 to 8 in., breadth 1·5 to 2 in.; petiole ·75 to 1·75 in., slender. *Panicles* terminal, longer than the leaves, slender, with lax spreading branches, quite glabrous. *Flowers* nearly ·2 in. in diam., in ultimate cymules, on pedicels longer than themselves. *Sepals* 5, ovate, acute, with membranous edges and a few hairs near the midrib on the back. *Petals* 5, longer than the sepals, linear-oblong, blunt, the apices reflexed, the base with a single ridge branching upwards. *Stamen* 1, longer than the petals, staminodes several. *Ovary* broadly ovoid, sub-compressed: *style* sub-lateral, as long as the petals. *Fruit* unknown. Hook. fil. Fl. Br. Ind. II, 15; Engler in DC. Mon. Phan. IV, 201.

Malacca: Griffith, No. 1096; Maingay, No. 467.

12. Mangifera gracilipes, Hook. fil. Fl. Br. Ind. II, 16. A large perfectly glabrous tree, young branches slender. *Leaves* sub-coriaceous, small, elliptic-lanceolate, acuminate, shining, the edges undulate, the base narrowly cuneate; main nerves 10 or 12 pairs, slightly prominent, the veins and reticulations obscure; length 3 or 4 in., breadth 1 to 1·5 in.; petiole ·75 to 1 in., very slender. *Panicles* quite glabrous, slender, longer than the leaves, terminal, with numerous long very slender raceme-like branches bearing numerous short lateral branchlets. *Flowers* about ·2 in. in diam., their pedicels slender and about as long as themselves. *Sepals* 5, ovate, sub-acute, puberulous. *Petals* 5, lanceolate, much longer than the sepals, with 3 to 5 prominent vertical ridges. *Stamen* 1, shorter than the petals; rudimentary stamens 4, subulate. *Ovary* sub-globose: *style* long, lateral. Engler in DC. Mon. Phan. IV, 203.

Malacca: Maingay, No. 475.

As yet this is known only by Maingay's specimens, not one of which bears fruit.

13. Mangifera odorata, Griff. Notul. IV, 417. A tree, all parts glabrous. *Leaves* coriaceous, oblong or elliptic-lanceolate, acute or acuminate, both surfaces reticulate but especially the lower; main nerves about 20 pairs, spreading, very prominent beneath: length 6 to 12 in., breadth 2 to 4 in.; petiole 1·25 to 1·75 in., much thickened in the lower half. *Panicle* longer than the leaves, stout, glabrous. *Flowers* about ·25 in. in diam., flesh-coloured. *Sepals* 5, ovate-oblong. *Petals* 5, three times as long as the sepals, oblong, greenish suffused with red, with 3 confluent ridges, the apices reflexed. *Perfect stamens* sometimes 2, nearly as long as the petals; the imperfect ones shorter, subulate and capitate. *Ovary* ovoid, glabrous, tapering into the long filiform sub-lateral style. *Drupe* oblong.

Malacca: Griffith, No. 1098.—Distrib. Java; Zollinger, No. 430.

The few specimens of this that I have seen are very poor. Griffith (quoted by Sir J. D. Hooker in F. B. Ind. *l. c.*) gives the following account of the fruit. "*Drupe* oblong, stinking, yellow-green, with yellow spots, filled with a sticky gum; flesh yellow, fibrous, sweet, not turpentiny; *stone* compressed, fibrous; *cotyledons* rugose, equal at the base, one overlapping at the top." Sir Joseph adds the following note. "Malay name "Koeene" or "Kohini," according to Griffith, which is the name Maingay gives to *M. oblongifolia* (a totally different plant). This much resembles *M. Parih*, Miq., of Java, which has a more effuse panicle with long tertiary branchlets and very long pedicels."

14. Mangifera foetida, Lour. Fl. Cochinch., 160. A tree 60 to 80 feet high; young branches stout, the bark pale when dry. *Leaves* very

coriaceous, elliptic-oblong to broadly-elliptic, sometimes slightly obovate, obtuse or sub-acute, the base slightly cuneate, both surfaces pale when dry and with the reticulations indistinct or obsolete: main nerves 16 to 18 pairs, bold, sub-horizontal; length 8 to 12 in., breadth 3·5 to 6 in.; petiole ·75 to 2·25 in., stout especially in its lower half. *Panicles* terminal or axillary, pedunculate, as long as or longer than the leaves, puberulous or glabrous, blood-red when fresh, black when dry; the branches stout, sub-erect and bearing scattered cymose branchlets, bracteoles minute. *Flowers* ·35 in. in diam., pinkish; pedicels very short, minutely bracteolate at the base. *Sepals* 5, thick, ovate-lanceolate, sub-acute, glabrous. *Petals* 5, linear-oblong, acute, twice as long as the sepals, reflexed from about the middle, with an elongated 2- or 3-fid thickening near the base and a short filiform basal claw. *Stamens* 5, but only 1 perfect and nearly as long as the petals, the others shorter, unequal and imperfect. *Disc* cylindric. *Ovary* sub-ovoid, glabrous; *style* slender, lateral. *Drupe* elliptic to globose, varying in form, oblique, green, 3 or 4 in. long. Roxb. Fl. Ind., ed. Carey, II, 440; Griff. Notul. IV, 419; DC. Prod. II, 63; Blume Mus. Bot. Lugd. Bat. I, 198; Miq. Fl. Ind. Bat. Vol. I, pt. 2, 632; Hook. fil. Fl. Br. Ind. II, 19; Kurz For. Flora Burma, I, 305; Engler in DC. Mon. Phan. IV, 212. *M. Horsfieldi*, Miq. Fl. Ind. Bat. Vol. I, pt. 2, 632.

Malacca, Penang, Singapore, and probably in all the other Provinces except the Andamans and Nicobars.—Distrib. Java, Sumatra.

I extract the following note from Sir Joseph Hooker's Flora of British India. "*Drupe* variable in form, not compressed, oblique, green, smooth, very fetid; *flesh* yellow, thick; *stone* almost 2-edged, chartaceous, fibrous; *cotyledons* equal, auricled at the base; *radicle* short. (*Griffith.*)—Maingay describes the fruit as coarse-flavoured, and not unlike Lanjoot (*M. lagenifera*), stringy. Malay name Bachang or Bachong. Rumph and Loureiro describe the drupe as hairy, but no one else does so; possibly the fibres of the stone are alluded to by these authors."

15. Mangifera fragrans, Maingay MSS. ex Hook. fil. Fl. Br. Ind. I, 18. A tree everywhere glabrous; young branches thick, black when dry. *Leaves* coriaceous, narrowly linear-oblong or linear-lanceolate, acute, acuminate or rounded at the apex, the edges undulate; the base acute, abruptly contracted into the very slender petiole, both surfaces conspicuously reticulate; main nerves 25 to 35 pairs, slender, almost horizontal; length 6 to 10 in., breadth 1·25 to 1·5 in.; petiole 1 to 2 in. *Panicle* longer than the leaves, on a long peduncle, spreading; its branches thick, glabrous, black when dry. *Flowers* nearly ·3 in long, erect, their pedicels thickened at their apices. *Sepals* 5? unequal,

ovate-lanceolate. *Petals* 5 ? narrowly linear-oblong, erect below but sharply reflexed about the middle, with 1 to 3 vertical ridges. *Stamens* 5, one much longer than the others whose anthers are imperfect (Hooker); *filaments* very slender, shorter than the lateral capillary style. ("*Drupe* obliquely broadly oblong-globose: the flesh yellow, acid and terebinthine: *stone* thin, fibrous, the testa coriaceous." *Maingay.*)

Malacca: Maingay, No. 473.

Concerning the species, Sir Joseph Hooker remarks in a note (*l. c.* 18) as follows: "This in foliage approaches very closely Blume's *M. macrocarpa* of Java, which has still narrower leaves with crimped edges, 40 pairs of nerves, and a bitter-sweet fruit as large as a child's head. Dr. Engler believes that this is *M. macrocarpa* Blume and (Mon. Phan. IV, 211) reduces it to that species. The very long narrow crisped-edged leaves and large fruit distinguish it."

16. MANGIFERA LAGENIFERA, Griff. Notul. IV, 414, t. 567, fig. 3. A tree 50 to 80 feet high; the young branches stout, pale when dry. *Leaves* very coriaceous, oblanceolate or oblong-lanceolate, obtuse or rounded, gradually narrowed below the middle to the stout petiole; both surfaces dull when dry, not reticulate, the 16 to 20 pairs of straight spreading main nerves very faint; length 3 to 6 in., breadth 1 to 1·75 in.; petiole ·5 to ·9 in., flattened. *Panicle* puberulous, (purple in colour when fresh) much exceeding the leaves, on a stout peduncle; the branches lax, ascending, and bearing pedunculate cymose branchlets. *Flowers* ·35 in. in diam., on pedicels shorter than themselves; bracteole large, broad, hooded. *Sepals* 5, (often 6) spreading, broadly ovate, pubescent outside. *Petals* 5, (often 6) two or three times as long as the sepals, erect, oblanceolate or sub-spathulate, obtuse, puberulous outside, slightly concave and thickened in the middle, purple. *Stamens* 5 or 6, all perfect, nearly as long as the petals; *anthers* ovate, short; *filaments* long, slender. *Disc* slender, cylindric. *Ovary* obliquely obovoid, glabrous; the *style* as long as the stamens, sub-terminal. (*Drupe* pyriform, pale green with a pink blush; *pulp* livid or of a purplish flesh-colour: *stone* fibro-coriaceous, adherent to the membranous testa; *radicle* basal, very large," Maingay) length 4·5 in., breadth 2·5 in.

Malacca: Griffith, No. 1104; Maingay, No. 469.

The description of the fruit above given was taken by Sir Joseph Hooker from Maingay's notes, and has been by me copied from the Flora of British India. Concerning the fruit Sir Joseph has the following note on Griffith's account of it which I quote verbatim from Fl. Br. Ind. II, 18. "Called Laujoot by the Malays, according to Maingay and Griffith. The latter describes the drupe as smooth, glaucescent,

fleshy, fetid, exuding a black varnish, traversed by innumerable fibres; *stone* ovate-lanceolate, fibro-coriaceous. *Seed* erect, adhering to the black tegument on the one side, on the other smooth; *cotyledons* with one half the surface smooth, the other wrinkled. Maingay describes the disc as hemispherical, but I do not find it so."

17. MANGIFERA KEMANGA, Blume Mus. Bot. Lugd. Bat. I, 202. A large tree with very stout young branches. *Leaves* crowded at the apices of the branches, coriaceous, sub-sessile, oblanceolate or obovate-oblong or cuneate-oblong, sub-acute or shortly and obtusely acuminate, the edges sub-undulate, gradually narrowed from below the middle to the base, glabrous and the reticulations obsolete on both surfaces: main nerves 20 to 22 pairs, slender but distinct on both surfaces, the midrib also broad and distinct; length 9 to 15 in., breadth 2·5 to 4 in.; petiole sometimes ·1 to ·3 in. but usually absent. *Panicle* large, terminal, much longer than the leaves, 20 to 30 in. long, on a stout angled peduncle covered by minute white hairs with a few longer brown ones intermixed: branches of the panicle angled, spreading and dividing, the flowers borne in cymules at the ends of the branchlets; *bracteoles* broadly ovate, concave, pubescent, deciduous. *Flowers* ·25 in. long, of a rich pinkish purple, their pedicels short. *Sepals* 5, erect, linear-lanceolate, thick, concave, pubescent outside, glabrous inside. *Petals* 5, less than twice as long as the sepals, erect, linear-lanceolate, concave, thick, the edges thickened and undulate, glabrous, with a single mesial ridge in front. *Stamen* 1, shorter than the petals: the anther ovate, short. *Disc* narrow, embracing the base of the sub-globose ovary; *style* sublateral, filiform: *stigma* small, terminal. *Drupe* (*fide* Griffith) oblong, a little gibbous at the base, obliquely emarginate near the apex, of a brown colour and with the smell of a dorian or mango: *flesh* and *juice* copious, fibres very abundant. *Stone* in outline lanceolate, rather compressed, not woody but fibro-coriaceous, seed erect. *M. policarpa*, Griff. Notul. IV, 416, t. 567, fig. 2; Hook. fil. Fl. Br. Ind. II, 20; Engler Mon. Phan. IV, 213.

Malacca: Griffith. Sumatra: Forbes, No. 3198.

This is a species closely allied to *M. caesia*, Jack, but the leaves of this are usually quite sessile and the panicle is greatly larger. Griffith's Malacca specimens consist of leaves only, his description extends to the fruit, but not to the flowers. I have described the flowers from Forbes's Sumatra plant, the leaves of which appear to me to resemble perfectly those of Griffith's Malacca specimens; and they agree to the minutest detail with Blume's full description. The vernacular name in Malacca is, according to Griffith, *Camang* which according to Blume changes on the Archipelago to *Kemang*, *Kamang* and *Kamanga*.

18. MANGIFERA CAESIA, Jack in Roxb. Fl. Ind. ed. Carey, II, 441. A large tree; young branches stout, rather rough from the cicatrices of fallen leaves. *Leaves* thickly coriaceous, broadly lanceolate or elliptic-oblong, shortly and bluntly acuminate, narrowed from about the middle to the short broad petiole; main nerves 20 to 25 pairs, thin, spreading, curving, the midrib stout and the reticulations obscure on both surfaces; length 6 to 12 in., breadth 2 to 3·5; petiole ·35 to ·5 in. long. *Panicle* large, erect, terminal, longer than the leaves, on a stout peduncle, minutely tawny-tomentose and of a glaucous reddish-colour: its branches numerous, spreading, dividing and bearing the flowers near their extremities in densely crowded cymules. *Flowers* ·3 in. long, on stout pedicels shorter than themselves with a broad elliptic bracteole at the base of each. *Sepals* 5, lanceolate, sub-acute, erect, pubescent. *Petals* 5, twice as long as the sepals, adnate to the disc, linear, erect, glabrous, with one central ridge, concave. *Stamen* 1, shorter than the petals, the anther short, staminodes very minute. *Disc* small, sub-5-lobed. *Ovary* obliquely ovoid; *style* sub-terminal. *Drupe* obovate-oblong, reddish-white. Griff. Notul. IV, 415; Hook. fil. Fl. Br. Ind. II, 19; Engler Mon. Phan. V, 213.

Malacca: Griffith, No. 1100; Maingay, No. 465.

19. MANGIFERA SUPERBA, Hook. fil. Fl. Br. Ind. II, 19. A very large tree: the young branches three-quarters of an inch thick. *Leaves* large, very coriaceous, cuneate-oblanceolate, sub-acute, the margins slightly undulate, gradually narrowed from the upper third to the short flattened stout petiole; both surfaces hard and quite glabrous, not reticulate; the midrib very stout, flattened on the upper but prominent on the lower surface; main nerves 30 to 35 pairs, spreading, not very prominent: length 10 to 16 in., breadth 3 to 5; petiole very stout, from ·5 to 1 in. long. *Panicle* terminal, much longer than the leaves, tawny-pubescent, on a very stout peduncle with many woody lanceolate bracts at its base; its primary branches few, sub-erect, with short branchlets crowded near the apex, the flowers densely crowded near the apices of the branchlets; bracts numerous, large, broadly lanceolate, concave, pubescent. *Flowers* ·75 in. long, lilac, their pedicels very short. *Sepals* 5, ovate-lanceolate, pubescent, concave, ·35 in. long. *Petals* 5, twice as long as the sepals, adnate to the cylindric disc, lanceolate, acuminate, recurved, veined, with a thickened central ridge on the lower half. *Stamen* 1, bearing a perfect anther, the others with imperfect small anthers, the filaments of all subequal. *Ovary* obliquely ovoid, tapering into a slender sub-terminal elongate style; *ovule* horizontal, laterally attached. Engler in DC. Mon. Phan. II, 214.

Malacca: Maingay, No. 476.

This is at once distinguished in the genus by its large flowers and prominently bracteolate peduncles. It has hitherto been collected only in Malacca, and only by Maingay. The great massing of semi-ligneous bracts at the base of the peduncle is quite unique in the genus.

Besides the foregoing there are in the Calcutta Herbarium flowering specimens of a *Mangifera* collected by Mr. L. Wray at an elevation of 3,400 feet on Gunong Batu Pateh in Perak, (Herb. Wray, No. 982). These have good flowers, but not one of them is in fruit. The species is 5-merous, and is evidently allied to *M. Griffithii*, Hook. fil. and to *M. longipes*, Griff. From the former of these it is distinguished by its glabrous—not puberulous—panicles, and more laxly reticulate leaves with shorter petioles. From *M. longipes* it differs in having shorter and more condensed panicles and smaller flowers. There are also fruiting specimens of a species gathered by the Calcutta Garden Collector, the late Mr. H. Kunstler, in Perak at an elevation of 500 to 800 feet (King's Collector, No. 7744); but none of them has a single flower on it. The fruit when ripe is described by Mr. Kunstler as yellowish-grey in colour, measuring from four to five inches in length, and about half as much in diameter. The leaves are oblong, tapering to each end, finely reticulate and with 13 to 15 pairs of faint ascending nerves. It is described as a tree 50 to 70 feet in height.

4. Anacardium, Rottb.

Shrubs or trees. *Leaves* alternate, petioled, simple, quite entire. *Panicles* terminal, bracteate. *Flowers* polygamous. *Calyx* deeply 5-partite; the segments narrow, erect, imbricate, deciduous. *Petals* 5, linear-lanceolate, recurved, imbricate. *Disc* filling the base of the calyx, erect. *Stamens* 8-10, all or some fertile; *filaments* connate and adnate to the disc. *Ovary* obliquely obovoid or obcordate; *style* filiform, excentric, stigma minute; *ovule* 1, semi-pendulous by a funicle from the side of the base of the ovary. *Nut* kidney-shaped, seated on a large pyriform fleshy body formed of the enlarged disc and top of the peduncle; *pericarp* cellular and full of oil. *Seed* kidney-shaped, ascending; testa membranous, adherent; *cotyledons* semi-lunar; *radicle* short, hooked.—Distrib. A small tropical American genus, of which one species is naturalised in Asia.

Anacardium occidentale, Linn. Sp. Pl. 548. A small tree. *Leaves* coriaceous, glabrous, obovate, obovate-oblong or elliptic; the apex obtuse, rounded or retuse, the edges entire; the base cuneate or sub-cuneate, rarely rounded; main nerves 10 to 12 pairs, spreading, rather prominent beneath; length 4 to 9 in., breadth 3 to 5 in.; petiole ·5 to ·75 in. *Panicles* terminal, longer than the leaves, on peduncles which lengthen

with age, puberulous toward the apex, the branches cymose; the flowers at the apices, ·5 in. long, the pedicel shorter; *bract* ovate-lanceolate, nerved, puberulous. *Sepals* lanceolate. *Petals* longer than the sepals, linear-lanceolate, deflexed from the middle. *Stamens* about 9, one longer than the others. *Fruit* 1 in. long; its peduncle large, fleshy, dark-coloured. Jacq. Ann. I, 121, t. 35; DC. Prod. II, 62; Roxb. Fl. Ind. II, 312; Wall. Cat. 990; Wight and Arn. Prodr. I, 168; Grah. Cat. Bomb. Pl. 40; Dalz. and Gibs. Bomb. Flor. Suppl. 18; Griff. Notul. IV, 408, t. 565, f. 3 *e. f.*; Hook. fil. Fl. Br. Ind. II, 20; Bedd. Fl. Sylv. t. 163; Kurz For. Flora Burma, I, 310; Engler in DC. Mon. Phan. IV, 219.—Rheede Hort. Mal. III, t. 54.

In all the Provinces, but always near villages and probably planted. A native of tropical America.

5. Gluta, Linn.

Trees with caustic juice. *Leaves* crowded at the ends of the branchlets, short-petioled, simple, oblong, coriaceous. *Panicles* axillary and terminal. *Flowers* small, hermaphrodite. *Calyx* spathaceous, bursting irregularly, caducous. *Petals* 4–6, adnate to the disc, imbricate. *Disc* elongate, rarely short. *Stamens* 4–6, inserted on the disc, filaments capillary. *Ovary* sessile on the disc or stipitate, oblique, 1-celled; *style* lateral, filiform, stigma simple; *ovule* solitary, pendulous from a basal funicle. *Drupe* sub-ligneous, stalked, dry, more or less irregularly globose, irregularly tubercled or ridged; the endocarp coriaceous, connate with the testa, juicy: *cotyledons* fleshy, large, connate: the radicle short and incurved.—Distrib. About six species all either Malayan or Burmese.

Calyx only about one-fourth of the length of the petals, glabrous; petioles short (·3 to ·6 in. long)	1. *G. Benghas.*
Calyx half as long as the petals.	
Calyx glabrous; petioles slender, ·6 to 1 in., long, ovary obliquely ovoid	2. *G. elegans.*
Calyx tomentose; ovary obliquely sub-reniform-orbicular, turbercled, glabrous; petioles very short (·1 to ·35 in.)	3. *G. coarctata.*
Calyx pubescent; ovary obovoid-rotund, tomentose; petioles ·6 or ·7 in. broad, channelled ...	4. *G. Wrayi.*

1. Gluta Benghas, Linn. Mant. 293. A tree. *Leaves* oblanceolate-oblong, the apex broad and rounded, rarely with a blunt apiculus; gradually narrowed in the lower half to the short narrow channelled petiole; both surfaces shining and reticulate; main nerves 18 to 20

pairs, spreading, not very prominent; length 4 to 7 in., breadth 1·6 to 2·25 in.; petitole ·3 to ·6 in. *Panicles* axillary, when in flower shorter than the leaves, when in fruit often longer, puberulous, the branches divaricate and corymbose, pedicels shorter than the buds. *Calyx* glabrous, only about one-fourth as long as the petals. *Petals* elliptic-lanceolate. *Stamens* 5, about half as long as the petals, the gynophore shorter than the stamens. *Ovary* obliquely globosely sub-reniform, the style sub-lateral, 2 imperfect ovaries sometimes present. *Drupe* irregularly globose or sub-reniform, much tuberculate, furrowed on one side, about 1·5 in. in diam. Willd. Sp. Pl. I, 1120; DC. Prod. I, 501; Blume Bijdr. 1159; Mus. Bot. Lugd. Bat. I, 182, t. 39. *G. Renghas*, Engler in DC. Mon. Phan. IV, 226, t. 6. *Stagmaria verniciflua*, Jack in Malay Misc. ex Hook. Comp. Bot. Mag. I, 267.

Pahang: Ridley, No. 1228.

Distributed over the whole Malayan Archipelago and known to the Malayas as *Renghas*, which was no doubt the name that Linnæus intended to use as the specific name, although it appears in his Mantissa as *G. Benghas*. The copious resin of this tree is acrid, but it forms the basis of an excellent varnish which is exported to China and Japan.

2. Gluta elegans, Kurz For. Flora Burma, I, 310. A small tree, every part except the inflorescence glabrous: young branches slender, with cinereous bark. *Leaves* coriaceous, oblong-lanceolate or elliptic-lanceolate, shortly and obtusely acuminate, the base cuneate; upper surface shining, the lower faintly reticulate and sub-glaucous; main nerves 10 to 14 pairs, spreading, faint or slightly prominent on the lower surface; length 3 to 6 in., breadth 1 to 2 in.; petiole ·6 to 1 in., slender, thickened at the base. *Panicles* much shorter than the leaves, mostly terminal, with alternate sub-corymbose branches each with 5 to 9 pedicellate flowers, bracteole linear. *Flowers* nearly ·5 in. long. *Calyx* tubular, split on one side, 4-nerved, glabrous, scarlet, the apex with 2 teeth. *Petals* 4 or 5, twice as long as the calyx, linear-lanceolote, blunt, spreading. *Stamens* 4 or 5, as long as the petals or longer. *Gynophore* half as long as the corolla. *Ovary* obliquely ovoid. *Drupe* oblong, gibbous, glabrous, ·75 in. long when dry, the scar of the style nearer the base than the apex. Hook. fil. Fl. Br. Ind. II, 22; Engler in DC. Mon. Phan. IV, 225. *Syndesmis elegans*, Wall. in Roxb. Fl. Ind., ed. Carey, II, 315; Cat. No. 1003.

Penang: Porter, (Wall. Cat. 1003 and 9049); King; King's Collector, No. 1366. Malacca: Maingay, No. 481. Perak: King's Collector, No. 4913.

Var. *Helferi*, Hook. fil. *l. c.* leaves linear-oblong, obtuse, nerves oblique.

Tenasserim and Andamans: Helfer, Nos. 1117 and 1118.

3. Gluta coarctata, Hook. fil. Fl. Br. Ind. II, 22. A small tree all parts except the puberulous inflorescence glabrous. *Leaves* thinly coriaceous, often recurved and conduplicate, obvate-oblong, oblanceolate-oblong or oblong, obtuse or sub-acute, narrowed in the lower third to the short stout petiole, occasionally minutely cordate; the edges often undulate: both surfaces shining and reticulate; main nerves 13 to 20 pairs, spreading, faint on both surfaces; length 5 to 9 in., breadth 1·75 to 3 in.; petiole ·1 to ·35 in., stout. *Panicles* axillary, shorter than the leaves, pedunculate, tawny-puberulous, with a few corymbose branches, each with 3 to 5 shortly pedicelled flowers nearly ·4 in. long when fresh. *Calyx* half as long as the petals, shortly bilobed, cinereous-tomentose. *Petals* 5, broadly oblanceolate, veined, puberulous outside. *Stamens* 5, shorter than the petals, the gynophore much shorter. *Ovary* obliquely sub-reniform, orbicular, rugulose, glabrous, the style lateral. *Drupe* sub-globose, apiculate, with an irregularly tuberculate ridge round the base, the sides also irregularly tubercle-ridged; the epicarp leathery; the mesocarp white, fibrous and spongy; the endocarp coriaceous, adnate to the erect seed. *Cotyledons* unequally sub-hemispheric, fleshy, about 1·5 in. long when fresh. Engler in DC. Mon. Phan. IV, 227, (excl. syn. *G. velutina* Bl.)

Malacca: Griffith, No. 1120. Perak: Scortechni, No. 1375. Johore: King and Hullett.—Distrib. Sumatra.

The Bornean species which Blume (Mus. Bot. Lugd. Bat. I, 183) names *G. velutina* is known only by his description which consists of the following six words "*paniculae ramis patentibus calycibusque sericeo velutinis.*" It is considered by Dr. Engler to be identical with this: but Blume's description, short as it is, appears to me to negative the suggestion.

4. Gluta Wrayi, King n. sp. A tree, all parts except the inflorescence glabrous. *Leaves* thickly coriaceous, elliptic, sub-acute, the edges sub-undulate, narrowed from about the middle to the broadly channelled petiole, both surfaces faintly reticulate when dry; the main nerves 12 to 14 pairs, spreading, quite obsolete on the upper surface, faint on the lower; length 4 to 6·5 in., breadth 1·6 to 2·5 in.; petiole ·6 or ·7 in. *Panicles* in the upper leaf-axils only, much shorter than the leaves, shortly pedunculate, densely and minutely pubescent, the branches spreading; the flowers numerous, ·4 in. long, crowded towards the apices; *pedicels* shorter than the buds. *Calyx* pubescent outside, about half as long as the petals. *Petals* 5, narrowly oblong-oblanceolate, rather blunt at the apex, the base clawed, puberulous outside, glabrescent inside. *Stamens* 5, longer than the petals, anthers short, filaments thickened

towards the base: *ovary* obovoid-rotund, tomentose; the *style* lateral, elongate. *Fruit* unknown.

Perak: Wray, No. 2290.

This differs from *G. coarctata*, Griff. in its longer leaf-petioles, shorter panicles, broader petals and sub-obovate-rotund, tomentose ovary. It has been hitherto collected only once by Mr. Wray: fruit is as yet unknown.

Note.—Kurz (Pegu Report 41, and in Journ. As. Soc. Bengal for 1876, pt. 2, p 210) refers (under the name *G. petiolata*) to a tree which he had seen common on the shores of the Andamans, but of which he had collected neither flowers nor fruit. The specimens to which he has attached this name in the Calcutta Herbarium do not, however, appear to me to be those of a plant of this genus.

6. MELANORRHŒA, Wall.

Trees with much oleo-resinous juice. *Leaves* alternate, simple, quite entire, coriaceous. *Panicles* axillary or terminal. *Flowers* rather large, hermaphrodite. *Sepals* 5, united, calyptriform or collar-like, deciduous. *Petals* 5–8, linear-oblong, imbricate, much enlarged in fruit. *Disc* hemispheric or columnar. *Stamens* 5–10, or very numerous, inserted on the disc; *filaments* slender. *Ovary* stalked, lenticular, oblique, 1-celled; *style* sublateral, stigma simple; *ovule* 1, pendulous from a basal funicle. *Fruit* dry, subsessile, or on a long pedicel rising from the stellately-spreading persistent petals, globose, coriaceous. *Seed* subglobose or oblong; *testa* papery; *cotyledons* thick, plano-convex; *radicle* ascending. A Malayan genus of about 9 species.

Sect. I. *Enmelanorrhoea:* petals accrescent in the fruit.

Calyx spathaceous and falling off like a calyptra.

Stamens 5.

Bracts if any small and deciduous.

Leaves broadly elliptic, the lower surface with many very minute hairs and numerous dots ... 1. *M. Maingayi.*

Leaves obovate-elliptic, glabrous on both surfaces, not dotted ... 2. *M. Wallichii.*

Bracts large and persistent, embracing the flower buds ... ... 3. *M. Woodsiana.*

Stamens 10 ... ... 4. *M. Curtisii.*

Calyx withering and remaining as a loose 3-toothed collar round the pedicel ... 5. *M. torquata.*

Sect II. *Apterae:* petals not accrescent.

Petals oblanceolate, leaves 6 to 15 in. long 6. *M. aptera.*

Petals elliptic, leaves 4 or 5 in. long ... 7. *M. inappendiculata.*

The characters of the genus *Melanorrhœa*, as defined by Wallich its founder, were modified, as regards the number of stamens, by Sir Joseph Hooker in the Flora of British India, in order to admit the pentamerous species *M. Maingayi* and *M. Wallichii*. I have ventured still further to modify them in two points, *viz.*, the calyptrate nature of the calyx, and the accrescence and persistence of petals as wings in the fruit. In the species which I have here named *M. torquata*, the calyx, instead of slipping off over the apex of the flower as a calyptra, drops downwards and forms a loose collar hanging round the pedicel. And, in the two species which I have named *M. aptera* and *M. inappendiculata*, the petals are deciduous and do not persist as wings to the fruit. But, even after these modifications, there remain a sufficient number of characters by which *Melanorrhœa* may be distinguished from its nearest ally *Swintonia*.

1. Melanorrhœa Maingayi, Hook. fil. Fl. Br. Ind. II, 25. A tree 80 to 100 feet high: the young branches rather slender, their bark when dry pale brown, at first puberulous afterwards glabrous. *Leaves* coriaceous, broadly elliptic, the apices rounded or obtuse, the base very slightly cuneate, the edges sub-undulate; both surfaces reticulate, shining, the upper glabrous, the lower with a few very minute hairs and many dots; main nerves 12 to 16 pairs, sub-horizontal, prominent on both surfaces but especially on the lower: length 3·5 to 6 in., breadth 2 to 3 in.; petiole 1 to 1·25 in. *Panicles* terminal and axillary, slender, two or three times as long as the leaves, tawny-pubescent especially towards the extremities, their branches few and sub-erect, the ultimate branchlets few-flowered. *Flowers* ·5 in. in diam., on slender pedicels; buds elliptic, acute, pubescent. *Petals* lanceolate, pubescent. *Stamens* 5; the filaments slender, pubescent above the middle. *Disc* elevated. *Ovary* tomentose. *Fruit* oblong, obtuse, about ·5 in. long, glabrescent; the enlarged petals at its base coriaceous, veined, linear-oblong, the gynophore very short. Engler in DC. Mon. Phan. IV, 235.

Malacca: Maingay, Nos. 482; 485; Derry. Perak: Scortechini, No. 1719: King's Collector, No. 7788. Singapore: Ridley, No. 4780.

2. Melanorrhœa Wallichii, Hook. fil. Fl. Br. Ind. I, 25. A very large tree; the young branches slender, glabrous. *Leaves* coriaceous, obovate-elliptic, the apex obtuse or rounded, the base slightly cuneate and somewhat oblique; both surfaces glabrous and shining, the lower reticulate, the upper obscurely so: main nerves 10 or 12 pairs, sub-horizontal, not very prominent; length 3·5 to 8 in., breadth 2 to 4 in.; petiole ·75 to 1·5 in., slightly winged, and somewhat dilated at the base, puberulous. *Panicles* numerous, axillary and terminal, branched from the base, about 12 in. long, the branches with slender

cinereous-tomentose branchlets and numerous softly pubescent flowers; bracts large, obovate, concave, membranous. *Flowers* ·25 in. long, on pedicels shorter than the buds. *Calyx* narrowly ovoid, very membranous. *Petals* narrowly oblong, villous on both surfaces, inserted towards the base of the short disc. *Stamens* 5. *Ovary* shortly stalked, densely pilose, attenuated into a style longer than itself. *Drupe* unknown. Engler in DC. Mon. Phan. IV, 235. *Stigmaria verniciflua*, Jack? in Wall. Cat. 980.

I have seen only Wallich's specimen of this in the Calcutta set of his plants. The specimen is a very poor one, and the above description is taken mostly from Sir Joseph Hooker. Mr. Derry collected in Malacca, (Herb. No. 1010) a plant of which there are two fruiting specimens in the Calcutta Herbarium which, from the shape of its leaves, I would have referred to this, were it not that remains of numerous stamens persist at the base of one of the young fruits. Mr. Derry's plant must I believe belong to an as yet undescribed species.

3. Melanorrhœa Woodsiana, Scort. MSS. in Herb. Calc. A tree 60 to 100 feet high; young branches velvetty-ferrugineous. *Leaves* thickly coriaceous, elliptic-oblong, elliptic or elliptic-rotund, the apex obtuse or rounded or emarginate, the edges sub-undulate, the base rounded or sub-cuneate; upper surface glabrous, the transverse reticulations rather distinct; the lower surface densely and uniformly rusty-tomentose, or glabrescent with age: main nerves 15 to 24 pairs, sub-horizontal, very prominent on the lower surface slightly so on the upper, length 4 to 5·5 in., breadth 1·75 to 3·5 in.; petiole 1 to 1·35 in, deeply channelled, dilated at the base, tomentose or glabrescent. *Panicles* from the upper leaf-axils, longer than the leaves, on long peduncles densely and minutely rusty-tomentose, branching more or less trichotomously towards the apex; the ultimate branches compressed, cymulose. *Flowers* sub-sessile, ·25 in. long, enveloped while in bud by imbricated concave broadly-ovate tomentose bracts; buds narrowly elliptic; the spathaceous calyx membranous, veined, puberulous. *Petals* 5, oblong. *Stamens* 5, anthers versatile, filaments hairy. *Ovary* obliquely ovoid, style lateral. *Drupe* elliptic, smooth, without a pedicel; the enlarged petals narrowly elliptic, obtuse, puberulous, red in colour, 1·5 in. long and ·75 in. broad (perhaps not quite fully grown).

Perak: Scortechini, No. 2086; King's Collector, No. 7788.

This has as yet been collected only by the late Father Scortechini and Mr. Kunstler, and their specimens have no ripe fruit. It approaches *M. Maingayi* in its leaves, but has much more tomentose panicles. The great distinctive mark, however, is that the flower buds of this are each enveloped in a large concave sheathing bract. As regards the pubes-

cence of the under surface of the leaves in this species there is some diversity, many specimens having the under surface covered with a dense and uniform layer of rusty tomentum, while in other specimens the lower surfaces of the leaves and the petioles are glabrescent. The species was named by Father Scortechini to commemorate his friend, the Revd. Father Tennison Woods, who died of an illness contracted during his exploration of the physiography of the central mountainous range of the Malayan Peninsula.

4. Melanorrhœa Curtisii, Oliver in Hook. Ic. Plantar, t. 1513. A tree 40 to 80 feet high: young branches very slender. *Leaves* coriaceous, oblong-lanceolate or elliptic-oblong, obtuse, or shortly and bluntly acuminate, the base cuneate, both surfaces quite glabrous and without scales or dots; main nerves 12 to 16 pairs, spreading, curving, faint; length 3 to 5 in., breadth 1·25 to 2 in.; petiole ·5 to ·75 in. *Panicles* slender, open, axillary and terminal, pedunculate, much longer than the leaves; the branches opposite or sub-opposite, distant, lax, each bearing several ultimate few-flowered branchlets near the apex, puberulous close to the flowers, otherwise quite glabrous; *bracteoles* small, ovate-lanceolate, caducous. *Flowers* ·25 in. long, on puberulous pedicels, the buds narrow. *Calyx* with dark nerves. *Petals* 5, linear, puberulous outside, contorted in æstivation. *Stamens* 10, a little shorter than the petals, glabrous; the *filaments* slender; the *anthers* small, oval. *Disc* pubescent. *Ovary* obliquely ovoid, stalked, glabrous. *Style* sub-terminal. *Drupe* depressed-globose, ·5 to ·75 in. in diam., its stalk ·35 in.; the enlarged petals leathery, linear-oblanceolate, 1·75 to 2·5 in. long. *M. Duthieana*, Scort. MSS. in Herb. Calcutta.

Penang: Curtis, No. 242; King's Collector, No. 1635. Perak: King's Collector, No. 6887. Kedah: Ridley, No. 5359.

The late Father Scortechini notes on this that the stamens are occasionally 8 instead of 10.

5. Melanorrhœa torquata, King n. sp. A tree 80 to 100 feet high: young branches stout, and with rough rather pale brown bark. *Leaves* coriaceous, obovate, with broad rounded apices, sub-undulate edges, and sharply cuneate bases; both surfaces glabrous, the upper with the reticulations almost obsolete, the midrib very broad and flat; the lower with the transverse veins rather distinct, the midrib sharply convex; main nerves 22 to 26 pairs, rather faint on the upper surface when dry, very distinct on the lower, spreading and rather straight; length 7 to 11 in., breadth 4 to 6·25 in.; petiole ·25 to ·35, stout. *Panicles* terminal, branching from the very base, densely and minutely tawny-tomentose; the branches spreading, naked below but with many branchlets toward the apex, the ultimate branchlets cymulose. *Flowers* ·25 in.

long, on pedicels ·2 in. long, buds ellipsoid. *Calyx* tubular or narrowly campanulate, its mouth with 3 broadly-triangular unequal teeth, puberulous externally, withering and hanging round the pedicels like a loose collar. *Petals* 5, slightly imbricate, elliptic, sub-acute, spreading or sub-reflexed, ·2 in. long, tomentose outside, pubescent inside. *Stamens* 5, nearly as long as the petals; *anthers* small, ovate; *filaments* subulate, pubescent below the middle. *Ovary* globose or obovoid, shorter than the gynophore, both tomentose; *ovule* solitary, its podosperm from the very base of the cell: *style* longer than the ovary, cylindric, pubescent except near the apex; *stigma* truncate. *Fruit* unknown.

Perak: King's Collector, No. 5552.

This differs in calyx from *Melanorrhœa* as usually understood inasmuch as in this plant the calyx separates from the flower soon after expansion and remains as a loose 3-toothed collar hanging round the pedicel; whereas in *Melanorrhœa* as hitherto defined, the calyx is calyptriform and is pushed off the flower by the expansion of the petals. In both cases the calyx is deciduous; in the one case it separates from the flower by the apex of the latter, in the other case by its base.

6. Melanorrhœa aptera, King n. sp. A tree 40 to 70 feet high; young branches stout, with rough cinereous bark, the cicatrices of the fallen leaves very prominent. *Leaves* very coriaceous, oblanceolate-oblong or obovate-elliptic; the apex broad and rounded, rarely with a short sub-acute point; narrowed from above the middle and decurrent on the short stout petiole; the edges quite entire, slightly revolute when dry; both surfaces glabrous, the upper pale greenish-brown when dry, the lower brown, the midrib on the upper surface broad and flattened in its lower half, on the lower surface convex; main lateral nerves 15 to 18 pairs, spreading, rather straight, somewhat prominent beneath; length 6 to 15 in., breadth 2 to 6 in, ; petiole ·5 to 1 in., stout. *Panicles* shorter or longer than the leaves, axillary, crowded near the ends of the twigs; their branches short, racemose, few-flowered, glaucous. *Flower-buds* narrowly ellipsoid, glabrous, ebracteate. *Flowers* 1 in. in diam., their pedicels ·25 to ·3 in. long, sparsely adpressed-pubescent. *Calyx* glabrous, about ·5 in. long at the time of falling. *Petals* 5 or 6, much imbricate, oblanceolate, densely adpressed-sericeous outside, glabrous inside. *Stamens* numerous (about 50), on a conical torus which is produced upwards into a gynophore. *Ovary* obliquely ovoid, compressed, ridged, glabrous, 1-celled, with a single oblong ovule pendulous from a basal funicle. *Style* sub-terminal, stout, bent, glabrous, longer than the ovary; *stigma* short, cylindric. *Drupe* depressed-globose, glabrous, with numerous thin vertical ridges, 1·5 in. in diam. *Seed* solitary,

1 in. long, the testa thin: *cotyledons* plano-convex, very thick and fleshy.

Perak: King's Collectors, Nos. 3485, 3727, 7656. Penang: Curtis, No. 1567.

A fine species readily distinguished by its large flowers and inappendiculate fruit.

7. MELANORRHŒA INAPPENDICULATA, King n. sp. A tree 50 to 60 feet high; young branches only as thick as a swan's quill, cinereous, rough. *Leaves* coriaceous, oblong-oblanceolate; the apex broad and rounded, sometimes retuse; the blade narrowed from above the middle to the narrowly cuneate base and prolonged along part of the petiole, the edges slightly revolute; both surfaces glabrous; main nerves 15 to 18 pairs, spreading, straight, slender; length 3·5 to 5 in., breadth 1·5 to 2 in.; petiole ·75 to 1 in., winged for half its length. *Panicles* about as long as the leaves, axillary, solitary in the axils of the leaves, few-flowered. *Flowers* ·75 in. in diam.; *petals* narrowly elliptic, blunt; *ovule* oblong, pendulous, its funicle attached to the side of the base of the wide loculus of the ovary, otherwise as in *M. aptera*. *Drupe* globular, glabrous, 1 to 1·5 in. in diam.

Perak: King's Collector, No. 5418. Penang: Curtis, No. 2475.

This is a second species of *Melanorrhœa* with non-accrescent petals. According to Mr. Curtis the petals are white, with a pink flush at the base, and the filaments are pink, while the anthers are green. The attachment of the funicle of the ovule in this species is to the side of the base of the ovular loculus, whereas in *M. aptera* it is attached to the centre of the base.

7. SWINTONIA, Griff.

Trees, quite glabrous. *Leaves* alternate, long-petioled, simple, quite entire. *Panicles* terminal and axillary, very large and broad. *Flowers* small, hermaphrodite or unisexual. *Calyx* small, 5-lobed; lobes rounded, imbricate. *Petals* 5, adnate to the middle of the disc, linear-oblong, imbricate, much enlarged and reflexed in fruit. *Disc* short or elongate or cylindric. *Stamens* 5, inserted on the top of the disc, free. *Ovary* sessile, ovoid, 1-celled, narrowed into the slender style; *stigma* capitellate; *ovule* pendulous from a basal funicle. *Drupe* ovoid, smooth, sessile, coriaceous, subtended by the 5 reflexed enlarged petals. *Seed* erect, testa thin, *cotyledons* amygdaloid. DISTRIB. The following are the only species known.

Bracts of the panicle inconspicuous or absent.

Leaves sub-coriaceous, main nerves 14 to 18 pairs; flowers on very short pedicels ... 1. *S. Schwenkii*.

Leaves coriaceous, main nerves 10 to 12 pairs, inconspicuous; pedicels longer than the flower, slender ... ... 2. *S. Penangiana.*

Flower-buds embraced by large concave imbricate bracts ... ... 3. *S. spicifera.*

Imperfectly known species ... ... 4. *S. lurida.*

1. SWINTONIA SCHWENKII, Teysm. and Binn. Cat. Hort. Bogor. (1866) p. 230. A tree; young branches slender, glaucous. *Leaves* sub-coriaceous, oblong-lanceolate or narrowly elliptic, shortly and obtusely acuminate, the edges sub-undulate, the base slightly narrowed but usually rounded; both surfaces obscurely reticulate, the lower paler when dry; main nerves 14 to 18 pairs, spreading and rather straight: length 3 to 6 in., breadth 1·25 to 1·5 in.; petiole 1·25 to 1·5 in. slender, with a slight swelling at the very base. *Panicles* crowded at the ends of the branches in the axils of the upper leaves, slender, usually longer than the leaves, pedunculate; the branches short, alternate, spreading, the ultimate branchlets cymose. *Flowers* polygamous, ·1 in. diam., on very short pedicels. *Segments* of the calyx united only at the base, orbicular, concave, glabrous. *Petals* oblong, obtuse, pubescent on both surfaces, rapidly enlarging in the ripe fruit and reflexed, 2·5 in. long, narrowly oblong, coriaceous, veined. *Drupe* oblong, smooth, ·75 in. long. Kurz in Journ. As. Soc. Beng. Vol. XXXIX, Pt. 2, (1870), 75; Engler in DC. Mon. Phan. IV, 232. *Anauxanopetalum Schwenkii*, Teysm. and Binnend. in Miquel Journ. I, 368. *Astropetalum* 2, Griffith, Notul. IV, 415.

Malacca: Griffith, No. 1156; Maingay, No. No. 486.—DISTRIB. Sumatra.

I have followed Sir Joseph Hooker and Dr. Engler in identifying this Malacca species of *Swintonia* with *S. Schwenkii*, T. B., although the specimens in the Calcutta Herbarium hardly bear this out. In the Calcutta Herbarium there are authentic specimens of *Anauxanopetalum Schwenkii*—the name originally given to the species by Teysm. and Binn. These specimens were collected in the Buitenzorg garden and were sent out by its authors. They are therefore practically type specimens, for as the authors explain (Miq. Journ. Bot. I, 369) the species was named in the Buitenzorg garden from specimens taken from trees originally received from Sumatra by Major Schwenk. Dr. Anderson in 1861 also collected in the Buitenzorg garden specimens of the same. These Buitenzorg specimens all agree in having flowers with rather long pedicels. Now, in describing *S. Schwenkii* in the Fl. Br. India from the Malacca specimens, Sir Joseph Hooker makes it a diagnostic mark of the species, as understood by him, that the flowers

are subsessile. In their leaves the Malacca and Buitenzorg specimens closely resemble each other, but the panicles of the latter are much larger than those of the former. I think it possible therefore that, when better specimens of the Malacca plant are collected, other characters may be found which will prove that it is not really the same as *S. Schwenkii*, T and B.

2. Swintonia Penangiana, King n. sp. A tall tree: young branches slender, glaucous. *Leaves* coriaceous, oblong-lanceolate, rarely ovate-lanceolate, tapering from the middle to the shortly bluntly acuminate apex and to the cuneate base; main nerves 10 to 12 pairs, spreading, faint on both surfaces, the reticulations obsolete: length 3 to 4·5 in., breadth 1·1 to 1·4 in; petiole ·75 to 1·25 in., slender, but slightly thickened near the base. *Panicles* axillary and terminal, as long as or longer than the leaves, pedunculate, slender, glabrous: the branches lax, spreading, the flowers in ultimate cymules of about three. *Flowers* ·15 in. long; their pedicels slender, longer than themselves. *Calyx* narrowly campanulate, with 5 broad subtruncate sub-ciliate lobes. *Petals* 5, longer than the calyx, sub-erect, oblong, obtuse, minutely tomentose, with glabrous margins. *Stamens* 5; the *anthers* elliptic, dorsifixed, the filaments slender. *Disc* thin, cylindric. *Ovary* obliquely ovoid, pubescent, tapering into the short sub-terminal style; *stigma* rather large for the genus. *Drupe* globular, glabrous, smooth, ·5 in. in diam., the reflexed accrescent petals narrowly oblong, sub-acute, about 1·35 in. long and ·3 in. wide, glabrescent.

Penang: Curtis, No. 1579.

A species allied to *S. floribunda*, Griff., but with shorter panicles, and globular not oblong, fruit. The leaves of this moreover are more coriaceous and have fewer nerves than these of *S. floribunda*.

3. Swintonia spicifera, Hook fil. Fl. Br. Ind. II, 27. A lofty tree: young branches smooth, reddish when fresh. *Leaves* coriaceous, oblanceolate or elliptic-obovate, the apex sub-acute or obtuse, the base attenuate-cuneate; upper surface shining, not reticulate, the lower pale brown when dry and glaucous: main nerves 13 to 20 pairs, obsolete on the upper and only slightly prominent on the lower surface, spreading, slightly curved; length 3·25 to 4·5 in., breadth 1·5 to 1·75 in.; petiole ·6 to 1·25 in. *Panicles* crowded near the ends of the branches, long-pedunculate, exceeding the leaves; the branchlets articulate; corymbosely crowded and trichotomously branched, angled, puberulous. *Flowers* ·2 in. long, each on a pubescent pedicel embraced by a broadly-ovate concave puberulous bracteole. *Calyx* fleshy, tubular, with 5 deep quadrate segments, puberulous outside, glabrous inside. *Petals* 5, twice as long as the calyx, thick, obovate-oblong, obtuse, concave, shortly

clawed. *Stamens* 4 or 5, shorter than the petals, filaments slender, the anthers short, oblong; *disc* thin, cylindric. *Ovary* stalked, obliquely ovoid, puberulous. *Drupe* obliquely ovoid, smooth, ·75 in. long, the accrescent petals reflexed, coriaceous, veined, 1·75 in. long, pericarp thin. Engler in DC. Mon. Phan. V, 233.

Penang: Maingay, No. 486/2; Curtis, No. 371; King's Collector, No. 1802. Perak: Scortechini, Nos. 1891, 2083; King's Collector, Nos. 3534, 3677.

Var. *Scortechinii*, King; leaves oblong-lanceolate, shortly and bluntly acuminate, the base rounded or sub-cuneate, main nerves 12 to 14 pairs.

Perak: Scortechini, No. 1891.

This species and its variety are both notable for the bracts which embrace the flower-buds.

4. SWINTONIA LURIDA, King n. sp. A small tree: all parts quite glabrous; the young branches slender, striate and dark-coloured when dry. *Leaves* thinly coriaceous, narrowly elliptic-oblong, the edges slightly thickened and undulate, the apex shortly abruptly and bluntly acuminate, the base cuneate, decurrent on the petiole; both surfaces glabrous and minutely reticulate; the upper shining, olivaceous green when dry; the lower dull, pale liver-coloured when dry; main nerves 22 to 24 pairs, rather faint, spreading to the edge without interarching, the secondary nerves almost as prominent: length 6 to 8 in., breadth 1·5 to 2·25 in.; petiole ·6 to ·75 in., thickened near the base. *Panicle* terminal, branching from the base, drooping, slender; the branches long, bearing short branchlets with the numerous flowers in small cymes. *MALE FLOWERS* a little more than ·1 in. longer, pedicelled. *Calyx* cupular, fleshy, with 5 broadly triangular teeth, glabrous. *Petals* 5, twice as long as the calyx, pale, oblong-elliptic, obtuse, with a truncate base, glabrous. *Stamens* inserted outside the shallow cupular dark-coloured slightly 5-lobed fleshy disc, shorter than the petals: *anthers* short, ovate, dorsifixed; *filaments* broadly subulate, with a very fine-pointed apex. *Rudimentary ovary* narrowly elliptic, sunk in the disc, tapering slightly upwards; no distinct style, stigma small, concave. *Semecarpus? lurida*, Hook. fil. Fl. Br. Ind. II, 34; Engler in DC. Mon. Phan. IV, 496.

Malacca: Maingay, No. 495. Perak: Wray, No. 3249.

A species of which female flowers and fruit are still unknown. Maingay's specimens were originally described by Sir Joseph Hooker as a doubtful species of *Semecarpus*, under the name ? *S. lurida*. They are very incomplete. Since Maingay's time good specimens of exactly the same plant, but still without female flowers or fruit, have been

collected by Mr. L. Wray in Perak. These have enabled Dr. Stapf, of the Kew Herbarium, and myself to refer the plant to the genus *Swintonia*, its nearest allies being *S. floribunda* and *S. Schwenkii*. In Wray's field note on his specimens he writes "flower pale-greenish-yellow : leaves shining, bright green above ; pale and bluish beneath."

8. PARISHIA, Hook. fil.

Tall trees with alternate unequally-pinnate leaves ; the *leaflets* coriaceous, entire. *Panicles* large, nodding. *Flowers* dioecious. *MALE FLOWER. Calyx* cupular, 4-lobed ; the lobes ovate, valvate. *Petals* 4, oblong, imbricate. *Disc* short, annular, obscurely 4-lobed. *Stamens* 4, inserted below the margin of the disc. *Rudimentary ovary* cylindric. *FEMALE FLOWER. Calyx* 4-lobed, the lobes persistent and greatly enlarged in fruit. *Petals* 4. *Ovary* sessile, ovoid, 1-celled ; *style* terminal, unequally 3-fid, stigmas capitate ; *ovule* pendulous from near the apex of the cell. *Fruit* sub-globose, dry, pubescent, bearing the persistent base of the style at its apex, the pericarp thin. *Seed* pendulous, its testa membranous ; *cotyledons* amygdaloid, radicle superior.—DISTRIB. 5 species, all either Burmese or Malayan.

Wings of accrescent-calyx 2·5 to 3 in. long ... 1. *P. insignis.*
Wings of accrescent-calyx 4·5 in. and upwards in length.
Leaflets glabrous beneath, the midrib and nerves very slightly puberulous... ... 2. *P. Maingayi.*
Leaflets rusty-pubescent on the lower surface 3. *P. pubescens.*

1. PARISHIA INSIGNIS, Hook. fil. in Trans. Linn. Soc. XXIII, 170, t. 26. A tall tree ; young branches stout, lenticellate, rusty-puberulous. *Leaves* 12 to 20 in. long, the rachis cylindric : *leaflets* 6 to 9 pairs, thinly coriaceous, obliquely ovate-oblong to oblong-lanceolate, acute or shortly acuminate : the base broad, rounded or sub-cordate, unequal ; upper surface shining, glabrous or glabrescent, the lower glabrescent and reticulate, or (var. *pubescens*) shortly and softly pubescent ; main nerves 8 to 12 pairs, spreading, curving ; length 3 to 5 in., breadth 1·2 to 2 in. ; petiolule ·1 to ·2 in. *MALE PANICLES* as long as the leaves, much branched, many-flowered, rusty-pubescent or tomentose. *Flowers* ·25 in. in diam., on pedicels longer than themselves. *Calyx* rusty-pubescent ; its lobes unequal, triangular. *Petals* oblique, broadly ovate, sub-glabrous, reflexed at the apex, longer than the calyx. *Stamens* about as long as the petals ; the *anthers* short, ovate, about one third as long as the filaments. *Disc* pubescent, 4-angled. *Female flower* not seen. *Fruit* sub-globular, ·5 in. in diam., the persistent remains of the style ·15 in. long ; accrescent calyx-wings narrowly oblong, blunt, 2·5 to 3

in. long, veined, pubescent. Hook. fil. Fl. Br. Ind. II, 30; Kurz For. Flora Burma, I, 318; Engler in DC. Mon. Phan. IV, 309. *Astronium insigne*, March. Rev. Anacard., 179.

Andaman Islands. Penang: Curtis, No. 2264. Langkawi: Curtis, No. 2806.—DISTRIB. Burma.

This species has not hitherto been supposed to go farther south than Burma. But it appears to me that Mr. Curtis's No. 2806 from Langkawi (an island off the coast a little to the southward of Burma) is probably this species, and also that his No. 2264 from Penang likewise belongs to this.

Var. *tomentosa*, King: *leaflets* pubescent on the lower surface. *Panicles* and *calyx* in all its stages densely rusty-tomentose.

Andaman Islands: King's Collectors.

2. PARISHIA MAINGAYI, Hook. fil. Fl. Br. Ind. II, 30. A tree: young branches stout, glabrous, sparsely lenticellate. *Leaves* 12 to 15 in. long, the petioles slightly dilated at the base; *leaflets* very coriaceous, 9 to 10 pairs, narrowly oblong or elliptic-oblong, not oblique, the apex acute, the edges sub-undulate, the base rounded or slightly cuneate; both surfaces shining and indistinctly reticulate, the upper quite glabrous, the lower slightly puberulous on the midrib and nerves; main nerves 15 to 20 pairs, spreading, faint; length 2·5 to 3·5 in., breadth 1 to 1·25 in.; petiolules about ·2 in. *Panicles* (*fide* Sir J. Hooker) apparently shorter than the leaves, pubescent. *Petals* linear-oblong. *Disc* pilose; young fruit narrowly ovoid, tapering to a long point, densely rusty-tomentose; the enlarged calyx-wings linear-oblong, sub-acute, pale puberulous, sub-coriaceous, striate, 4·5 in. long and about ·5 in. broad.

Malacca: Maingay, No. 488.

Except Maingay's, I have seen no specimens which I can refer to this species. I have copied from the Fl. Br. Ind. Sir J. D. Hooker's description of the panicles and flowers, neither of these being represented in the Calcutta Herbarium. There is some doubt as to whether the fruits and leaf specimens brought together by Maingay really belong to the same tree; and not only so, but it is doubtful whether the fruits of two species have not been mixed up by him. For Sir Joseph Hooker notes that, while some of the fruits are densely covered with hispid ferrugineous bristles and have accrescent calyx-wings 6 to 7 inches long with rounded apices, others are pubescent and have wings only 4·5 in. long with acute tips. The species clearly requires investigation in the field.

3. PARISHIA PUBESCENS, Hook. fil. Fl. Br. Ind. II, 30. A lofty tree: young branches stout, deciduously rusty-tomentose. *Leaves* 12 to 18 in. long; the petiole pubescent, terete above, dilated near the

base; *leaflets* 5 to 7 pairs, subsessile, thickly coriaceous, oblong, acute or acuminate, the base rounded; upper surface glabrous except the densely pubescent midrib; the lower shortly rusty-pubescent, reticulate; main nerves 12 to 16 pairs, irregular, spreading and ascending, curved, prominent on the lower surface when dry; length 4·5 to 5·5 in., breadth about 1·5 in.; petiolules very short (only ·05 to ·1 in.), or absent. *Panicle* rather shorter than the leaves, divided to the base into numerous fascicled branches, densely and softly tomentose. *Flowers* ·5 in. in diam., pedicelled. *Ovary* conical, pilose; *styles* 3? *Fruit* broadly ovoid, apiculate, ·5 in. long, densely tomentose, the pericarp cartilaginous; accrescent-calyx-wings thinly coriaceous, pale, striate, adpressed-puberulous or almost glabrous, narrowly oblong, sub-acute, 4·5 to 5 in. long and about ·5 in. broad. Engler in DC. Mon. Phan. IV, 310.

Malacca: Maingay, No. 487.

A very imperfectly known species collected hitherto only by Maingay, and as much in want of investigation as the last.

9. Campnosperma, Thwaites.

Trees. *Leaves* alternate, very coriaceous, simple, quite entire. *Racemes* axillary, simple or sparingly branched. *Flowers* sessile, minute, hermaphrodite. *Calyx* 3–5-partite; *segments* erect, persistent, imbricate. *Petals* 3–6, suborbicular, erect, imbricate. *Disc* urceolar. *Stamens* 6–10, inserted at the base of the disc. *Ovary* free, sessile, ovoid, 1-celled; *style* very short, stigma discoid or capitate; *ovule* 1, pendulous from the top of the cell. *Drupe* ovoid, fleshy; *stone* hard, almost 2-celled by a vertical plate from the top of the horse-shoe-shaped cell. *Seed* pendulous, curved round the imperfect septum: *cotyledons* curved, rather flat; *radicle* short superior.—Distrib. mostly Tropical Asiatic.

Male flowers sessile	1.	*C. Griffithii.*
Male flowers pedicelled.		
Female flowers in short racemes; the males in long panicles; fruit ·6 in. in diam. ...	2.	*C. auriculata.*
Male and female flowers in sub-equal panicles; fruit ·2 to ·25 in. long	3.	*C. Wallichii.*

1. Campnosperma Griffithii, Marchand Rev. Anacard. 174. A tree 60 to 80 feet high; young branches very stout, rough and with sparse minute tomentum. *Leaves* very coriaceous, obovate-oblong or elliptic, the apex very broad, rounded or emarginate, the edges slightly recurved when dry; the base much cuneate, slightly decurrent on the broad stout channelled petiole; upper surface quite glabrous, the midrib depressed; lower surface minutely stellate-pubescent, the midrib very

convex and strong ; main nerves 24 to 36 pairs, spreading, only slightly curved, projecting on the lower surface, depressed on the upper; length 7 to 15 in., breadth 3·5 to 5·5 in.; petiole 1·25 to 2·5 in., tomentose, dilated at the base. *Panicles* of male flowers axillary, slender, shorter than the leaves, rusty stellate-tomentose; the branches only a few inches long, spreading, spicate, bearing the flowers in small crowded sessile glomeruli. *Flowers* about ·05 in. in diam., sessile. *Calyx* thick, cupular, cut into 4 broad sub-acute concave ovate-rotund segments, rusty-tomentose outside. *Petals* 4, a little exceeding the calyx, thin, pale, glabrous, elliptic-ovate, concave. *Stamens* 4 or 8, in two rows; *filaments* thickly subulate, anthers short; *disc* crenate, fleshy. *Panicle of female* flowers shorter and less branched than that of the males. *Drupe* ovoid, slightly oblique, glabrous, ·35 in. long. *C. macrophylla*, Hook. fil. Fl. Br. Ind. II, 41; Engler in DC. Mon. Phan. IV, 316; Miq. Fl. Ind. Bat. I, pt. 2, p. 637.

Malacca: Griffith, No. 1109; Maingay, No. 484/2. Singapore: T. Anderson, No. 71. Perak: Wray, No. 2575; King's Collector, No. 5327, 6528, 6541 and 7292.—Distrib. Sumatra, Borneo, Bangka.

This species was first named as a *Campnosperma* by Marchand in 1869, and he based his description of it on Griffith's Malacca specimen No. 1109. The plant had previously (1850) been named *Buchanania macrophylla* by Blume in Mus. Bot. Lugd. Bat. I, 185. Had Marchand known this, he ought to have named it *Campnosperma macrophylla* instead of *C. Griffithii*. It is easily recognised by its sessile glomerulate flowers; although its fruit closely resembles that of the plant which is accepted as *C. Griffithii* both by Sir Joseph Hooker and by Dr. Engler, but which is here named *C. Wallichii*.

2. Campnosperma auriculata, Hook. fil. in Fl. Br. Ind. II, 41. A tall shrubby tree: young branches as thick as a swan's quill, glabrous, polished, lenticellate. *Leaves* thinly coriaceous, obovate-oblong or oblanceolate-oblong, the apex rounded sometimes retuse or emarginate, tapered gradually in the lower two-thirds and continued down the petiole as a wing to its slightly auricled base; both surfaces glabrous, minutely reticulate; main nerves 9 to 18 pairs, oblique, not prominent on either surface; length 4 to 9 in., breadth 1·75 to 3 in.; petiole below the auricles only ·1 or ·2 in., glabrous. *Panicles of male flowers* 10 to 14 in. long, axillary, covered with scurfy minute stellate rusty tomentum; the branches slender and with numerous many-flowered branchlets. *Flowers* pedicellate, ·15 in. in diam. when expanded. *Calyx* cupular, puberulous outside, with 4 broadly triangular segments. *Petals* 4, twice as long as the calyx-teeth, elliptic, obtuse, deflexed. *Stamens* 8; four longer than the others, spreading and longer than the petals, the other 4 shorter. *Disc*

large, fleshy, corrugated, ovary none. *Female flowers* in racemes shorter than the panicles of the males and stouter. *Flowers* ·15 in. in diam., on stout puberulous pedicels. *Calyx* thick, cupular, puberulous, with 4 broad triangular segments. *Petals* 4, broadly triangular, puberulous, larger than the calyx-segments. *Stamens* 8, shorter than the petals, the anthers imperfect. The *disc* a deep fleshy cup with crenate edges. *Ovary* broadly ovoid, rusty-tomentose, crowned by the large discoid glabrous obscurely-lobed reflexed stigma. *Drupe* ovoid-rotund, compressed, minutely tomentose, fleshy, ·6 in. in diam. Engler in DC. Mon. Phan. IV, 320. *Buchanania auriculata*, Blume in Mus. Bot. Lugd. Bat. I, 185. *Semecarpus? grandifolia*, Wall. Cat., No. 985 (excluding the specimens mentioned in the Appendix to the Cat.).

Penang: Wallich, No. 985. Malacca: Maingay, No. 484/4. Singapore; Kurz, Anderson, No. 69; Ridley, Nos. 444, 1880 and 4775 E.; Hullett, No. 223. Penang: Curtis, No. 1037.

This is distinguished from the next species by its smaller leaves and panicles and much larger fruit. It is the plant from Penang, issued by Wallich as No. 985 of his Catalogue, which he doubtfully referred to the genus *Semecarpus*, as *S. ? grandifolia*. Along with this however Wallich issued, as noted in the Appendix to his lithographed Catalogue, (p. 286) under the same number, but not (as is usual with Wallich's plants in similar cases) distinguished by any letters, the much larger (although in other respects similar) leaves of another species. The specific name *grandifolia* is not applicable to the present plant which is the true *Buchanania auriculata* of Blume (not however of Miquel), although it is applicable to the supplementary sheets of 985, one of which, as issued by Wallich is 30 inches in length. I have followed Sir Joseph Hooker and Dr. Engler in retaining Blume's specific name *auriculata* for the present plant. But, for the supplementary sheets, I do not propose to retain Wallich's name of *grandifolia* (his name having really been given to two things), but I propose for them the name *Campnosperma Wallichii*. In this I do not follow the distinguished Botanists just mentioned, for they call them *C. Griffithii*, Marchand. But Marchand's name, in my opinion, ought to be given to the plant on which he founded that species, which (as he mentions in his Monograph) was Griffith's No. 1109. And this I do in spite of the fact that Griffith's No 1109 is exactly what Blume named *Buchanania macrophylla*. There is no doubt that, had Marchand known of Blume's name, he ought to have called his plant *Campnosperma macrophylla*. But as he did not, and as he was the first to put the plant into the genus *Campnosperma*, his name *C. Griffithii* must I think remain; and another name must be found for what Sir Joseph Hooker and Dr. Engler name *C. Griffithii*;

and that other name I propose to make *C. Wallichii*, in commemoration of its earliest collector.

3. Campnosperma Wallichii, King. A tall much-branched tree: young branches very stout, rough. *Leaves* coriaceous, the blade obovate-oblong with broad rounded and sometimes emarginate apex, tapering from about the middle downwards, forming a narrow wing to the petiole and expanding at its base into a small auricle; both surfaces glabrous and minutely reticulate; main nerves 20 to 30 pairs; length 10 to 30 in., breadth 4 to 7 in.; petiole 2 to 3 in. long, dilated, channelled, glabrous. ***Panicles of male flowers*** axillary, shorter than the leaves, stellately rusty-tomentose, with slender much-branched suberect many-flowered branchlets. *Male flowers* ·1 in. in diam., pedicelled; *calyx* thick, puberulous outside, its segments 4, broadly triangular, blunt; *petals* 4, larger than the calyx segments, ovate-rotund, concave, glabrous; *disc* fleshy, corrugated: *stamens* 8 in two rows, the outer 4 slightly longer than the inner 4. ***Panicles of male flowers*** about the same length as those of the male, but with shorter branches and fewer flowers; *flowers* larger than the males; *ovary* ovoid, puberulous; *drupe* ovoid-globular, slightly compressed, glabrous, ·2 to ·25 in. long. *C. Griffithii*, Hook. fil. in Fl. Br. Ind. II, 41 (not of Marchand); Engler DC. Mon. Phan. IV, 320. *Campnosperma auriculata*, Miq. (not of Blume) Fl. Ind. Bat. I, pt. 2, p. 637. *Semecarpus? grandifolia*, Wall. Cat. 985 *in part* (*i.e.* as to the specimens mentionedon p. 286 of the Appendix to the Catalogue.)

Penang: Porter, (Wall. Cat., 985). Malacca: Maingay, No. 464/3. Singapore: Kurz, Goodenough.—Distrib. Sumatra: Forbes, No. 3030.

This is in general appearance very like *C. auriculata*. The great difference between the two lies in the fruit which in this is only about ·2 in. long, while in *M. auriculata* it is ·6 in. in diam. Other distinctions are to be found in the leaves, which in this are larger than in *C. auriculata*. The texture and venation are, however, the same in both; and both have curious small rounded auricles at the base of the petiole. The panicles of male and female flowers in this species are sub-equal, whereas in *M. auriculata* the panicles bearing male flowers are several times longer than these bearing females.

10. Microstemon, Engler.

Trees, with alternate exstipulate unequally-pinnate leaves. *Flowers* small, in axillary many-branched panicles, hermaphrodite. *Calyx* small, with 5 imbricate segments. *Petals* 5, much larger than the calyx, obovate, spreading, imbricate in æstivation. *Disc* annular, suberect, 10-toothed. *Stamens* 5, alternating with an equal number of capitellate,

or spathiform staminodes: *filaments* very short, thickened towards the base; *anthers* broadly ovate, dorsifixed. *Ovary* ovoid-globose, its base immersed in the disc, unilocular, with a single pendulous ovule. *Style* terminal, very short, thick; the *stigma* broad, fleshy, with 3 broad spreading blunt lobes. *Fruit* obliquely oblong-ovoid, attenuate towards the apex; the *pericarp* leathery, 1-celled, 1-seeded. *Seed* with membranous testa, exalbuminous, the cotyledons flat, the radicle curved.—Distrib. three species, all Malayan.

Leaflets tomentose on the lower surface ... 1. *M. velutina.*
Leaflets glabrescent and minutely scurfy (when dry) on the lower surface, the axils of the main nerves with tufts of white hair ... ... 2. *M. Curtisii.*

1. Microstemon velutina, Engler in DC. Mon. Phan. IV, 294. A tall tree: young branches, rachises and under surfaces and petioles and rachises of leaves and the inflorescence softly pubescent-tomentose, rusty-cinereous. *Leaves* 6 to 10 in. long, the petiole slender; *leaflets* 7 to 11, thinly membranous, oblong-lanceolate, entire, shortly and bluntly acuminate; the base slightly narrowed, cuneate or rounded; upper surface glabrous except the pubescent midrib; main nerves 12 to 16 pairs, spreading, rather obscure; length 2 to 4 in., breadth ·8 to 1·5 in.; petiolule ·15 in., the terminal one longer. *Panicles* pedunculate, much branched towards the apex, the branches very slender. *Flowers* numerous, less than ·1 in. in diam., sessile. *Calyx* glabrous, the lobes elliptic. *Petals* obovate, glabrescent on the outer surface, minutely tomentose on the inner. *Fruit* narrowly oblong, compressed, with a rusty scurfy leathery pericarp, 1-celled, 1-seeded (young) ·75 in. long and ·35 or ·4 in. broad. *Pentaspadon ? velutinus*, Hook. fil. Fl. Br. Ind. II, 28.

Malacca: Griffith, Maingay (Kew Distrib.), No. 464. Perak: Scortechini, No. 1924; King's Collector, No. 7417. Pahang: Ridley, No. 2560.

2. Microstemon Curtisii, King. A medium sized tree *(Curtis)*; young branches slender, deciduously puberulous, their bark pale and lenticellate when dry. *Leaves* 5 to 7 in. long, the petiole and rachis slender and puberulous; *leaflets* very dark when dry, about 7, membranous, narrowly oblong-lanceolate, acuminate, entire, the base rounded and slightly oblique, with scattered short hairs, the midrib and nerves pubescent, not reticulate; lower surface glabrescent, minutely scurfy when dry, the midrib and nerves puberulous; main nerves 13 to 17 pairs, ascending, curved, with conspicuous tufts of white hair at their junction with the midrib: length 1·75 to 3 in., breadth ·75 to ·9 in.; petiolules ·1 in., the terminal one ·2 in. *Panicles* near the end of the branches, axillary, slender, slightly longer than the leaves,

pedunculate, puberulous; the branches divergent, the flowers solitary or in clusters of 2 to 4 at rather distant intervals. *Flowers* less than ·1 in. in diam., on pedicels shorter than themselves. *Calyx* cupular, with 5 spreading concave broadly-ovate acute segments, puberulous outside, glabrous inside. *Petals* 5, broadly elliptic, very obtuse, twice as long as the calyx, minutely pubescent on the inner surface, glabrescent on the outer. *Stamens* 5, shorter than the petals, the filaments not swollen at the base. *Disc* glabrous. *Ovary* conical, glabrous: *stigma* minute. *Drupe* unknown.

Kedah: Curtis, No. 2620.

A species of which I have seen only Mr. Curtis's specimen from Kedah. It is readily distinguished from the preceding two by the tufts of white hair in the axils of the main nerves on the under surface of the leaflets. The stigma is very minute and it is not easy to make out the three lobes which characterise the genus. The flowers have, however, the staminodes and disc of the genus.

11. Pentaspadon, Hook. f.

Trees. *Leaves* unequally pinnate; *leaflets* opposite, sub-sessile, entire. *Panicles* axillary, peduncled, much-branched, branchlets very slender. *Flowers* pedicelled, minute, hermaphrodite. *Calyx-lobes* 5, imbricate. *Petals* 5, oblong-obovate, strongly imbricate. *Stamens* 5, minute, inserted at the base of the disc, alternate with 5 short subulate staminodes which are free or adnate to the side of the disc; filaments short, broadly subulate; *anthers* didymous. *Disc* cupular, obscurely 10-lobed. *Ovary* seated on the disc, very minute, 1-celled, contracted into a stout short style; stigma globose or obliquely oblong, much bent to one side; *ovule* 1, pendulous from the upper part of the cavity.

1. Pentaspadon officinalis, Holmes MSS. in Herb. Soc. Pharm. Lond. A tree 60 to 100 feet high: young branches puberulous and with prominent small brown warts. *Leaves* 4 to 7 in. long, the rachises puberulous or glabrescent: *leaflets* 7 to 9, thinly coriaceous, oblong- or elliptic-lanceolate, entire, shortly and bluntly acuminate, the base narrowed, both surfaces glabrous: the lower with tufts of short hair in some of the nerve axils, curving upwards; main nerves 6 to 9 pairs, interarching far from the margin, rather prominent on the lower surface when dry; length 1·75 to 2·75 in., breadth ·8 to 1·25 in.; petiolules ·15 in., those of the upper leaflets twice as long. *Panicles* pedunculate, as long as or exceeding the leaves, much branched towards the apex; the branchlets slender, minutely cinereous-tomentose. *Flowers* numerous, about ·05 in. in diam., their pedicels shorter than themselves. *Calyx-lobes* rounded. *Petals* obovate-rotund, glabrous. *Drupe* narrowly ellip-

tic, compressed ; the pericarp fleshy, pale and covered with rusty scurf, 1-celled, 1-seeded, ·65 to ·8 in. long.

Perak : King's Collector, Nos. 3315, 3770, 4868, 6549, 6933 : Scortechini, No. 2043 ; Wray, No. 4168.

This plant is known to the Malay population of Perak as the source of *Minyak Plang*, a dark brown viscid oil which is in great repute for the cure of certain skin diseases. An interesting note upon the plant and its oil by Mr. E. M. Holmes of the Pharmaceutical Society of London is to be found in the Journal and Transactions of that Society, Vol. LII, p. 389. The stigma in this species, prior to dissection, appears to be sub-globular with a central groove ; and it is only after careful maniputation that it is seen to be bent on itself. Some specimens of this were by mistake issued from the Calcutta Herbarium under the name *Microstemon officinale*, Holmes.

12. Rhus, Linn.

Trees or shrubs, often with an acrid juice. *Leaves* alternate, simple or 1–3 foliolate or pinnate ; *leaflets* entire or serrate. *Flowers* small, in terminal and axillary panicles, polygamous. *Calyx* small, 4–6-parted, persistent ; the segments unequal or equal, imbricate. *Petals* 4–6, equal, spreading, imbricate. *Stamens* 4, 5, 6, or 10, inserted at the base of the disc, free ; *filaments* subulate ; *anthers* short, imperfect in the ♀ flower. *Ovary* sessile, ovoid or globose, 1-celled : *styles* 3, free or curved, short or long ; *stigmas* simple or capitate ; *ovule* pendulous from a basal funicle. *Drupe* small, dry, compressed ; *stone* coriaceous, crustaceous or bony. *Seed* pendulous from the funicle, testa membranous, cotyledons flattish ; radicle hooked, short, superior.—Distrib : about 114 species, mostly extra-tropical in both hemispheres, a few Malayan, some from tropical Africa.

Rhus Perakensis, Scortechini MSS. A glabrous shrub climbing to the extent of 15 to 40 feet. *Leaves* 8 to 12 in. long, unequally pinnate ; *leaflets* in rather distant pairs, opposite, thinly coriaceous, oblong, shortly and bluntly acuminate, entire ; the base slightly oblique, rounded or sub-cuneate ; main nerves 16 to 20 pairs, sub-horizontal, rather prominent on the lower surface ; length 2·5 to 3·5 in., breadth 1 to 1·4 in. ; petiolules ·1 to ·15 in., the terminal one ·3 or ·4 in. *Panicles* axillary and terminal, longer than the leaves, pedunculate, the branches rather short, bearing the flowers on small ultimate racemes. *Flowers* numerous, less than ·1 in. in diam., on short minutely bracteolulate pedicels. *Calyx* with 5 unequal oblong blunt spreading segments. *Petals* longer than the calyx, elliptic, blunt, pinnately nerved. *Stamens* 5 ; *anthers* broadly ovate, dorsifixed. *Drupe* compressed, obliquely reniform, orbicular, broader than long, glabrous, ·2 in. across.

Perak: Scortechini, No. 1668; Wray, Nos. 2316, 3095; King's Collector, Nos. 3626, 4896, 5046, 6537, and 6807.

The nearest ally of this is probably *M. succedanea*, L., than which it, however, has much larger panicles and smaller more reniform drupes. It has moreover differently veined petals, and the leaflets are less narrowed to the base. It differs, however, not only from that, but from every other Indian or Malayan species in being scandent. Of the scandent habit there appears to be no doubt whatever, for the fact is noted on almost every specimen in the Calcutta Herbarium.

13. Odina, Roxb.

Trees with few stout branches. *Leaves* few at the ends of the branches, alternate, unequally-pinnate, deciduous; *leaflets* opposite, quite entire. *Racemes* simple and panicled, terminal, fascicled. *Flowers* small, monœcious, or dicœcious, fascicled, shortly pedicelled. *Calyx* 4–5-lobed, persistent; *lobes* rounded, imbricate. *Petals* 4–5, imbricate. *Disc* annular, 4–5-lobed. *Male flower Stamens* 8–10, inserted within the disc. *Ovary* 4–5-parted. *Female flower Ovary* sessile, oblong, 1-celled; *styles* 3–4, stout, stigmas simple or capitellate; *ovule* pendulous from near the top of the cell. *Drupe* small, compressed, oblong, sub-reniform, crowned by the distant styles; *stone* hard. *Seed* compressed; *embryo* curved, cotyledons flat fleshy, radicle superior.—Distrib. About 12 species, mostly African.

Odina Wodier, Roxb. Fl. Ind. II, 293. A small deciduous tree 20 to 40 feet high: young branches thick, puberulous at first, soon becoming glabrous. *Leaves* 12 to 18 in. long; *leaflets* 3 or 4 pairs, obliquely ovate, acuminate; the base rounded or sub-cuneate, unequal; the edges entire; length 3 to 6 in.; the petiolules ·15 in. long. *Male racemes* compound, the female simple, puberulous. *Flowers* crowded in cymose fascicles on the racemes or panicles, bracts ciliate. *Sepals* obtuse. *Petals* twice as long as the sepals, oblong, spreading. *Stamens* in the male equalling the petals.—*Drupe* about ·5 in. long, red. W. and A. Prodr. I, 171; Thwaites Enum. 78; Grah. Cat. Bomb. Pl. 42; Wt. Ic. t. 60; Bedd. Fl. Sylv. t. 123; Wall. Cat. 8475; Royle Ill. t. 31; Dalz. and Gibs. Bomb. Fl. 51; Brandis For. Flor. 123; Miq. Fl. Ind. Bat. Vol. I, Pt. 2, p. 622; Hook. fil. Fl. Br. Ind. II, 29; Kurz For. Flora Burm. I, 321; Engler in DC. Mon. Phan. IV, 267.

The Andaman and Nicobar Islands. Penang: (probably planted.) —Distrib. British India.

14. Melanochyla, Hook. f.

Trees. *Leaves* simple, very coriaceous, exstipulate, quite entire. *Panicles* branched, axillary and terminal. *Flowers* small, unisexual. *Calyx-tube* persistent, slightly enlarged in fruit and adnate to the very base of the drupe, cupular or campanulate, lobes 5, erect. *Petals* 5, inserted on the edge of the disc; very coriaceous, persistent, erect or sub-erect, villous in front, valvate. *Disc* lining the calyx-tube. *Stamens* inserted on the edge of the disc; filaments stout, sometimes coherent at the base with the petals, villous; *anthers* oblong. *Ovary* globose, 1-celled; *style* short, stigmas 3; *ovule* 1, pendulous from near the top or from the side of the cell. *Drupe* globose, areolate at the base by the enlarged calyx, flesh full of black varnish; *stone* thick, hard. *Seed* oblong, testa thin; *cotyledons* amygdaloid, radicle superior.—Distrib. Malayan Peninsula and Archipelago: about 12 species.

Leaves more or less hairy on the lower surface.

Leaves elliptic-oblong.

The whole of the under-surface of the leaves rusty-tomentose, panicles condensed ... 1. *M. densiflora.*

Petioles midrib and main nerves on the under surface of the leaves rusty-tomentose, panicles lax ... ... 2. *M. tomentosa.*

Leaves oblong-oblanceolate or narrowly elliptic-oblong.

Lower surface of the leaves glaucescent, the midrib and main nerves with adpressed brown hairs, leaves 2·75 to 5 in. long .. 3. *M. Kunstleri.*

Lower surfaces of the leaves slightly pubescent, leaves 5 to 8 in. long ... ... 4. *M. Maingayi.*

Leaves glabrous on both surfaces.

Leaves much elongate, narrowly oblong, their bases cordate or auriculate, sessile or with very short petioles.

Drupes vertically ridged ... ... 5. *M. auriculata.*

Drupes very rugose, not ridged ... 6. *M. rugosa.*

Leaves oblong-lanceolate, oblong-elliptic or oblong-oblanceolate, with distinct slender petioles.

Inflorescence densely crowded and with large prominent bracts ... ... 7. *M. bracteata.*

Inflorescence more or less laxly paniculate, not bracteate.

Young branches and panicles covered with a thin felted layer of minute tomentum, flowers less than ·1 in. long... ... 8. *M. angustifolia.*

Young branchlets glabrous, panicles pubescent-tomentose (not felted), flowers more than ·1 in. long ... ... 9. *M. nitida.*

1. MELANOCHYLA DENSIFLORA, King n. sp. A tree 60 to 100 feet high; young branches stout, covered with short rusty deciduous tomentum. *Leaves* very coriaceous, oblong-elliptic, sometimes slightly obovate, subacute, somewhat narrowed to the rounded slightly unequal base; upper surface glabrous, not reticulate, the midrib and nerves slightly depressed when dry; lower surface densely and minutely rusty tomentose, the midrib very prominent as are the 20 to 25 pairs of strong subhorizontal main nerves; length 6 to 8·5 in., breadth 2·5 to 3·5 in.; petiole ·65 to 1 in., thickened and channelled near the base. *Panicle* terminal, condensed, shorter than the leaves, branched from the base, everywhere rusty-tomentose; branches numerous, the branchlets racemulose and bearing the flowers in ultimate sub-sessile crowded cymules. *MALE FLOWERS* ·2 in. long, sessile; *buds* ovoid, gibbous near the base *Calyx* fleshy, campanulate, rusty-tomentose externally with 5 triangular sub-acute sub-erect segments. *Petals* 5, twice as long as the calyx-teeth, erect, thick, elliptic, obtuse, tomentose along the midrib externally, the edges glabrous, but with a tuft of coarse hairs along the lower part of the midrib. *Stamens* 5, shorter than the petals, anthers elliptic; filaments compressed, densely villous in front, about as long as the anthers; *disc* small, slightly convex, villous in the middle; *ovary* 0. *FEMALE FLOWER* and *drupe* unknown.

Perak: King's Collector, Nos. 5615 and 5626.

A species allied to *M. tomentosa*, Hook. fil.; but at once distinguished from that by its denser panicles, larger and more numerous flowers. This is also much more hairy on the under surface of the leaves than *M. tomentosa*. Female flowers and fruit are still unknown.

2. MELANOCHYLA TOMENTOSA, Hook. fil. Fl. Br. Ind. II, 38. A tree: young branches rather slender, densely rufous-tomentose. *Leaves* coriaceous, elliptic-oblong, sometimes slightly obovate, shortly and sharply acuminate, the base rounded but slightly narrowed; upper surface quite glabrous except the pubescent base of the midrib; lower surface reticulate, glabrescent, pale when dry, the midrib and nerves more or less rufous-pubescent like the petiole: main nerves 20 to 30 pairs spreading, prominent on the lower surface; length 6·5 to 14 in., breadth 2·75 to 4 in.; petiole ·35 in., stout, rufous-pubescent. *Panicles* terminal, about as long as the leaves, the main axis rufous-tomentose; the branches slender, distant, sub-erect, puberulous, spike-like, bearing the flowers in distant sub-sessile cymules. *MALE FLOWERS* about ·1 in. in diam. *Calyx* with 5 deep unequal ovate concave segments, puberulous externally.

Petals 5, thick, oblong, obtuse, longer than the calyx, pubescent outside, villous inside. *Stamens* nearly as long as the petals, the filaments stout. *Female flower* not seen. *Drupe* elliptic to sub-globose, ferruginous-pubescent, orange-yellow when ripe, 1 to 1·5 in. in length. Hook. fil. Ic. Plant. t. 1292, 1293; Engler in DC. Mon. Phan. IV, 470.

Malacca: Maingay, No. 1428.—Distrib. Java (*fide* Engler): Zollinger, No. 800.

3. Melanochyla Kunstleri, King n. sp. A tree 80 to 100 feet high: young branches as thick as a quill, lenticellate and with deciduous sparse rusty pubescence. *Leaves* very coriaceous, elliptic-oblong, sometimes oblanceolate-oblong, tapering to each end, shortly acuminate; the edges with a shining cartilaginous thickening, slightly recurved when dry; upper surface glabrous, shining, not reticulate, the midrib prominent; lower surface paler, glaucescent, the midrib and 18 to 20 pairs of prominent spreading main nerves with adpressed brown hairs; length 2·75 to 5 in., breadth 1 to 1·5 in.; petiole ·35 in., slightly scurfy. *Panicles* terminal, twice as long as the leaves, minutely rusty-tomentose, with numerous short spreading racemose branches. *Male flowers* ·15 in. long, on pedicels shorter than themselves. *Calyx* coriaceous, minutely tomentose outside, cupular, deeply divided into 5 broadly-ovate acute slightly-spreading segments. *Petals* 5, thrice as long as the calyx-segments, narrowly elliptic, blunt, pubescent on the outer surface, densely villous on the inner surface, the margins only glabrous. *Stamens* 5, much shorter than the petals; the *anther* narrowly ovate, the filament subulate, slightly villous. *Ovary* 0. *Female flowers* and *drupe* unknown.

Perak: King's Collector, No. 6810.

The nearest ally of this is *M. Maingayi*, from which, however, this may be distinguished by the smaller leaves more shining on the upper surface, and by the adpressed brown hairs on the under surface of the midrib and nerves.

4. Melanochyla Maingayi, Hook. fil. Fl. Br. Ind. II, 39. A tree: young branches slender, scurfy-puberulous. *Leaves* very coriaceous, oblong-oblanceolate or narrowly elliptic-oblong, abruptly and shortly acuminate, tapering in the lower two-thirds to the short channelled petiole; upper surface glabrous, faintly reticulate, shining, the midrib very prominent; lower surface slightly pubescent; main nerves 18 to 24 pairs, spreading, prominent on the lower surface, only slightly so on the upper: length 5 to 8 in., breadth 1·25 to 2·25.; petiole ·5 or ·6 in. *Panicle* terminal, longer than the leaves, rusty-tomentose; the branches spreading, rather short; the ultimate branchlets cymose, about 3-flowered. *Male flowers* about ·1 in. in diam., on short stout pedicels

Calyx with 5 ovate acute segments, rusty-tomentose. *Petals* several times longer than the calyx-segments, elliptic, obtuse, externally adpressed rusty-tomentose but with broad glabrous edges. *Female flowers* twice as long as the male; the *calyx* sub-urceolate; *ovary* globose, hairy. *Drupe* unknown. Engler in DC. Mon. Phan. IV, 471.

Malacca: Maingay, No. 490.

5. Melanochyla auriculata, Hook. fil. Fl. Br. Ind. II, 39. A tall tree; young branches very stout, glabrous. *Leaves* coriaceous, sessile or nearly so, oblong or oblanceolate-oblong, shortly and rather abruptly acuminate, the edges subundulate, tapering from the middle to the narrow auriculate base; both surfaces glabrous and shining, the upper drying of an olivaceous brown, very faintly reticulate, the lower liver-coloured and with the reticulations more distinct; main nerves about 30 pairs, thin but distinct on both surfaces, sub-horizontal; length 12 to 18 in., breadth 3·5 to 4·75 in; petiole when present very stout, broad, less than ·5 in. long, often adnate to the branch. *Male panicles* axillary, shorter than the leaves, puberulous; the branches short, lax, cymose, 2- to 3-flowered. *Flowers* ·3 in. long, on stout pedicels about as long as themselves. *Calyx* campanulate, coriaceous, minutely tomentose outside, deeply cut into 5 broadly-ovate sub-acute segments. *Petals* 5, longer than the calyx-segments, elliptic, obtuse, externally adpressed-pubescent, but with the edges glabrous, internally minutely pubescent and with a large villous tuft in the lower half. *Stamens* 5, shorter than the petals, with small anthers and pubescent filaments. *Male flowers* not seen. *Drupe* oblong, obtuse or depressed-globose, rusty-tomentose, when ripe 1·25 to 1·5 in. long, vertically ribbed, stone very thick. Engler in DC. Mon. Phan. IV, 470.

Malacca: Maingay, No. 491; Derry, No. 1189. Singapore; Ridley Nos. 3588, 3975.

6. Melanochyla rugosa, King n. sp. A large tree; young branches as thick as a goose-quill, tawny-pubescent with long pale flexuose hairs intermixed. *Leaves* coriaceous, narrowly oblong, sometimes almost oblanceolate, shortly and sharply caudate-acuminate, tapering very gradually to the cordate sub-auriculate base: upper surface smooth, shining, and quite glabrous; the lower dull, pale, and distinctly reticulate, glabrous except a few scattered stiff hairs near the base of the stout grooved midrib; main nerves 25 to 30 pairs, spreading, curving upwards and interarching at the apices; length 7 to 15 in., breadth 1·6 to 3·25 in.; petiole ·35 to ·5 in., very stout, dilated, pubescent like the young branches. *Male panicles* not seen. *Female panicles* terminal, about half as long as the leaves, stout, rusty-pubescent, with a few distant short branches. *Female flowers* ·3 in. in diam.,

depressed-hemispheric, sessile. *Calyx* coriaceous, tomentose outside, divided into 5 orbicular-ovate acuminate concave conniving segments. *Petals* 5, not much exceeding the calyx, coriaceous, broadly triangular, minutely pubescent, with a small villous patch at the base in front. *Stamens* rudimentary. *Ovary* broadly conical, rusty-tomentose; the style terminal, glabrescent, shorter than the ovary; *stigma* capitate, 3-lobed. *Drupe* globular-ovoid, very rugulose, rufous-tomentose, ·75 to 1 in. long and ·65 to ·9 in. in diam. (probably not quite mature).

Perak, at Tapu: Wray, No. 1301.

A species with leaves somewhat like those of *M. auriculata*, but smaller: collected only once.

7. Melanochyla bracteata, King n. sp. A tree 50 to 80 feet high: young branches slender, glabrous, with pale lenticellate bark. *Leaves* coriaceous, narrowly oblong-lanceolate, tapering to each end, the apex caudate-acuminate, the base narrowly cuneate; both surfaces glabrous: the upper shining; the lower dull, paler than the upper, glaucescent; main nerves 10 to 12 pairs, slender, faint, curving upwards: length 4 to 6 in., breadth 1 to 1·6 in.; petiole ·5 to ·75 in., thickened in the lower half. *Male flowers* ·25 in. long, crowded in small sub-sessile cymules on axillary or terminal rusty-pubescent congested racemes or few-branched panicles as long as or longer than the leaves; *bracts* at the bases both of the cymules and of the individual flowers, ovate, acuminate, concave, rusty-pubescent like the calyx and petals, and as large as the flowers. *Calyx* campanulate, with 5 ovate acute segments. *Petals* 5, longer than the segments of the calyx, lanceolate, acuminate, with a dense villous tuft on the lower half of the anterior surface. *Stamens* 5, shorter than the petals; the *anthers* linear, glabrous; the *filaments* thick, compressed and densely villous from base to apex. *Disc* lining the inflated tube of the calyx, ovary none. *Female flowers* not seen. *Drupe* ovoid or ovoid-globular, minutely tomentose, about ·75 in. in length, the pericarp with a thick black juice.

Perak: King's Collector, Nos. 5549 and 7303.

A very distinct species distinguished by the small size of its leaves and by its congested bracteate inflorescence.

8. Melanochyla angustifolia, Hook. fil. Fl. Br. Ind. II, 39. A tree: young branches slender, covered with a thin close layer of very minute tomentum. *Leaves* coriaceous, oblong or oblanceolate-oblong, shortly acuminate, the edges slightly undulate, the base cuneate, sometimes unequal, both surfaces glabrous, the lower reticulate: main nerves 12 to 16 pairs, spreading, prominent like the midrib on the lower surface, less so on the upper, length 4·5 to 10 in., breadth 1·5 to 4 in.; petiole ·75 to 1·5 in., dilated and channelled near the base.

Panicles of male flowers axillary or terminal, as long as or much longer than the leaves, very slender, with many spreading branches, everywhere minutely tomentose like the young branches. *Male flowers* in lateral cymules from the branchlets, sub-sessile, less than ·1 in. long; *calyx* tubular-campanulate, the lobes erect, oblong-triangular, sub-acute, rusty-tomentose externally; *petals* oblong, sub-acute, much longer than the calyx, adpressed-pubescent outside, villous in the lower half inside; *stamens* shorter than the petals, the anthers small, elliptic; the *filaments* subulate, villous, *ovary* none. *Panicles of male flowers* shorter than the males: *female flowers* not seen. *Drupe* globose, apiculate, minutely tomentose like the panicle, ·5 to ·75 in. in diam. Engler in DC. Mon. Phan. IV, 469.

Malacca: Maingay, No. 492. Perak: King's Collector, No. 3359.

9. Melanochyla nitida, King n. sp. A tree; young branches rather slender, angled and dark-coloured when dry. *Leaves* very coriaceous, oblong-elliptic or oblanceolate-oblong, shortly bluntly and rather abruptly acuminate, narrowed from the middle or below it to the long plano-convex stout petiole: both surfaces quite glabrous; the upper shining and not reticulate; the lower paler, dull, with the wide reticulations slightly prominent; main nerves 12 to 16 pairs, slightly prominent on both surfaces when dry, spreading and curving upwards: length 4 to 11 in., breadth 2·25 to 3·25 in.; petiole 1 to 2 in., thickened in the lower half or third. *Panicles* terminal, minutely tomentose, but not felted, slightly longer than the leaves; the branches few, scattered, ascending, having few spicate short branchlets bearing the flowers in ultimate sessile cymules. *Male flowers* more than ·1 in. long, sessile, crowded; *calyx* coriaceous, campanulate, deeply cut into 5 broadly-triangular acute sub-erect concave segments, tomentose outside: *petals* 5, triangular-oblong, thick, longer than the calyx-teeth, adpressed-pubescent externally but with broad glabrous edges; internally glabrous but with a large tuft of coarse hairs on the middle of the lower half: *stamens* 5, shorter than the petals, the filaments densely villous; *disc* small, villous in the middle; *ovary* none. *Female flowers* ·2 in. long, on short pedicels; *stamens* present but apparently without pollen; *ovary* filling the whole fundus of the flower, hemispheric, densely rusty-tomentose, tapering into a short stout conical hairy style; *stigma* sub-capitate. *Drupe* unknown.

Perak: Scortechini, No. 2037; Wray. Penang: Curtis, No. 1496. Perak: King's Collectors, No. 6722.

The nearest ally of this is *M. angustifolia* which has, however, its young branches and panicles covered with a thin felted layer of minute tomentum; whereas, in this plant, the young branches are glabrous

and the panicle is pubescent-tomentose not felted. The flowers of this moreover are larger than those of *M. angustifolia*, the main nerves are more oblique, and the reticulations wider and less distinct.

15. SEMECARPUS, Linn. f.

Trees. *Leaves* alternate, simple, quite entire, coriaceous. *Flowers* small, polygamous or dicœcious, in terminal or axillary panicles. *Calyx* 5–6-fid, segments deciduous. *Petals* 5–6, imbricate. *Disc* broad, annular. *Stamens* 5–6, inserted at the base of the disc, imperfect in the ♀ flowers. *Ovary* 1-celled; *styles* 3; *ovule* pendulous from a basal funicle. *Drupe* fleshy, oblong or sub-globose, oblique, seated on a fleshy receptacle formed of the thickened disc and calyx base; *pericarp* loaded with acrid resin. *Seed* pendulous, testa coriaceous, inner coat somewhat fleshy; *embryo* thick, cotyledons plano-convex, radicle superior.—DISTRIB. About 40 species, tropical Asiatic and Australian.

Leaves densely rusty-pubescent on the lower surface	1. *S. velutina.*
Leaves with the lower surface densely clothed with pale very minute scales	2. *S. Curtisii.*
Leaves at first puberulous on the lower surface but ultimately glabrous	
Panicles tomentose; flowers glabrous, sessile; leaves oblanceolate-oblong, with 20 to 26 pairs of nerves	3. *S. Kurzii.*
Panicles puberulous, flowers pedicelled; leaves broadly elliptic, with 10 to 15 pairs of nerves ...	4. *S. lucens.*
Leaves quite glabrous; panicles glabrous in the lower part, pubescent towards the extremities; flowers subsessile, the calyx puberulous: leaves oblanceolate-oblong, with 18 to 24 pairs of main nerves	5. *S. Prainii.*

1. SEMECARPUS VELUTINA, King n. sp. A dicœcious tree 50 to 60 feet high: young branches softly rufous-pubescent, the bark pale. *Leaves* thickly coriaceous, obovate-elliptic or oblanceolate, rarely elliptic, shortly and abruptly acuminate, the edges sub-undulate, narrowed from the middle or above it to the stout petiole; upper surface glabrous except the slightly-pubescent depressed midrib, shining and minutely reticulate; the lower surface densely and softly pubescent, the transverse veins and the reticulations distinct; main nerves 20 to 24 pairs, slightly depressed on the upper surface, very prominent on the lower, spreading and interarching near the edge; length 6 to 13 in., breadth 2·5 to 5 in.; petiole ·5 to 1·25 in. *Panicles* of flowers of both sexes

terminal, stoutly pedunculate, rusty-tomentose, those with female flowers longer than the leaves, those with males shorter; the branches of both short, ascending, those of the male more numerous. *Male flowers* ·1 in. in diam., much crowded in short sub-globular sessile cymose fascicles; *calyx* cupular, flat, with 5 spreading broad triangular acute teeth, pubescent outside; *petals* 5, longer than the sepals, broadly elliptic, acute, glabrescent. *Stamens* 5, the filaments longer than the petals; *disc* broad, convex, fleshy, hairy in the middle; *ovary* none. *Female flowers* less numerous than the males and twice as large: *calyx* rusty-tomentose and petals pubescent outside; *petals* acute. *Stamens* with very small anthers. *Ovary* obliquely hemispherical, slightly compressed, densely rusty-tomentose: *styles* 3, short, horizontally radiating, pubescent; *stigmas* truncate. *Drupe* transversely oblong, ·35 in. from base to apex and ·6 in. from side to side, compressed, sparsely tomentose, the enlarged peduncle about one-third of its length, thin, cup-shaped, sparsely pubescent.

Perak: King's Collector, Nos. 7439, 7622 and 7655.

Allied to *S. Anacardium*, Linn. fil., but well distinct from that and from any other hitherto described species.

2. Semecarpus Curtisii, King n. sp. A small tree: young branches stout, their bark pale. *Leaves* coriaceous, oblanceolate-oblong, shortly and bluntly acuminate, the edges slightly undulate, gradually narrowed from the upper third to the stout petiole, upper surface shining, greenish when dry, reticulate; the lower dull, pale from very minute scales; main nerves 18 to 20 in., spreading and interarching within the pale cartilaginous edge, very prominent and pale on the lower surface, faint on the upper; length 13 to 16 in., breadth 4 to 5 in.; petiole 1·5 to 2 in., very stout. *Panicles* much shorter than the leaves, branching from near the base; the branches ascending, angled, tawny-puberulous, the ultimate branchlets cymose. *Flowers* unisexual and the sexes on different panicles, shortly pedicelled. *Male flowers* ·15 in. in diam.; *calyx* cupular, with 5 ovate sub-acute spreading segments, minutely tomentose externally: *petals* 5, spreading, much longer than the calyx, elliptic, obtuse, minutely tomentose on the outer, glabrescent on the inner surface; *stamens* 5, longer than the petals, the anthers small, the filaments narrow, compressed; *disc* sub-convex, pubescent; *ovary* 0. *Female flowers* larger than the male; *stamens* rudimentary; *ovary* obliquely globose-ovoid, compressed, densely tomentose; *styles* 3, radiating, horizontal or depressed, glabrous, bifid at the apex. *Drupe* unknown.

Tongka: Curtis, No. 2930.

A very distinct and handsome species; readily recognised amongst

the Malayan species by its large leaves which are very pale glaucescent beneath : collected hitherto only by Mr. C. Curtis, of the Forest Department, Penang.

3. Semecarpus Kurzii, Engl. in DC. Mon. Phan. IV, 489. A small tree : young branches stout, rough and lenticellate, covered with deciduous dense minute rusty tomentum. *Leaves* coriaceous, oblanceolate-oblong, suddenly and very shortly acuminate, gradually narrowed in the lower three-fourths to the short stout dilated petiole, the edges sub-undulate : both surfaces minutely reticulate ; the upper glabrous, shining, olivaceous when dry ; the lower pale brown when dry and not shining, glaucescent, sparsely covered with short stiff deciduous hairs; main nerves 20 to 26 pairs, spreading, slightly ascending, interarching near the edge, prominent on the lower surface, rather faint on the upper ; length 12 to 24 in., breadth 3 to 4·25 in. ; petiole stout, dilated, channelled, ·6 to 1 in. long. *Panicle* terminal, longer than the leaves, the main rachis stout ; the branches slender, ascending, lax, the ultimate branchlets spicate, everywhere tomentose. *Flowers* sessile, ·1 in. in diam. *Calyx* cupular, thick, with 5 shallow spreading orbicular teeth, sub-ciliate at the edges, otherwise glabrous. *Petals* 5, much longer than the calyx, broadly elliptic, sub-acute, glabrous externally, puberulous internally. *Stamens* 5, shorter than the petals ; the *filaments* flattened, puberulous. *Disc* convex, glabrous ; *rudimentary ovary* pilose. *Drupe* obliquely ovoid, sub-compressed, keeled, glabrous, 1 in. long, and about as much across the swollen peduncle, deciduously pubescent, obconic, about ·5 in. long. *S. heterophyllus*, Kurz (not of Blume) in Journ. As. Soc. Beng. Vol. XLV, Pt 2, (1876) p. 126 ; For. Flora Burma, I, 312.

Nicobar Islands ; Jelinek, No. 210 ; Kurz ; King's Collector. Bati Malv, Dr. Prain.

Distinguished by its long lax tomentose panicle and glabrous sessile flowers. Dr. Prain's specimens from the little-known island of Bati Malv are in ripe fruit and have no flowers, but I have no hesitation in referring them to this species.

4. Semecarpus lucens, King n. sp. A tree 40 to 70 feet high ; young branches rather slender, with pale glabrous bark. *Leaves* coriaceous, broadly elliptic ; rarely sub-ovate-elliptic, the apex obtuse and rounded or very shortly and abruptly acuminate ; the edges with a shining pale margin, sub-undulate, the base cuneate and slightly oblique ; upper surface glabrous and shining, greenish when dry, reticulate ; lower surface pale brown when dry, not shining, conspicuously reticulate, the nerves and reticulations broad and shining, sparsely shortly and deciduously puberulous ; main nerves 10 to 16 pairs, stout, shining, broad and conspicuous on the lower surface, thin and only

slightly prominent on the upper, spreading, interarching near the edge: length 4 to 7·5 in., breadth 2 to 3·25 in.; petiole ·75 to 1·5 or even 2 in., thickened near the base. *Panicles* usually terminal, pedunculate, longer than the leaves, puberulous; the branches slender, long, lax, sub-erect; the branchlets short and bearing the flowers in rather crowded ultimate fascicles. *Flowers* ·15 in. in diam., on pedicels shorter than themselves. *Male flowers calyx* cupular, flat, with 5 ovate acute spreading teeth, glabrous; *petals* 5, ovate-lanceolate, acute, several times longer than the calyx, glabrous: *stamens* 5, shorter than the petals; the cells of the anthers divergent, the filaments flattened; *disc* fleshy, flat, with a small concave pit, puberulous. *Female flowers* on smaller fewer-flowered panicles; the flowers themselves larger than the males; *calyx* as in the male; *petals* broader and more fleshy. *Stamens* 5, short and rudimentary, each rising from one of the angles of the cupular fleshy 5-angled glabrous disc. *Ovary* tomentose, conical, slightly oblique, its base surrounded by the disc. *Styles* 3, horizontal or depressed, radiating. *Drupe* (young) obliquely ovoid, compressed, the enlarged peduncle about a third of its length, rusty-puberulous.

Perak: King's Collector, Nos. 5256, 5377, 5444, 5470, 6895.

5. Semecarpus Prainii, King n. sp. A tree 40 to 50 feet high; young branches rather stout, deciduously puberulous. *Leaves* oblong-oblanceolate to obovate oblong, shortly and abruptly acuminate, the edges slightly undulate, gradually narrowed from the upper third to the rather short petiole; both surfaces glabrous and minutely though distinctly reticulate, the upper pale-greenish when dry, the lower pale brown; main nerves 18 to 24 pairs, prominent on the lower surface, slightly so on the upper, the lower pairs sub-horizontal, the upper spreading and curving upwards; length 5 to 10 in., breadth 1·5 to 3·25 in; petiole ·5 to ·8 in. *Panicles* terminal, pedunculate, glabrous below, pubescent towards the extremities, longer than the leaves; the branches numerous, slender, with many branchlets, the ultimate branchlets cymulose. *Flowers* rather crowded, almost sessile, globular in bud, about ·1 in. in diam. when expanded. *Calyx* cupular, puberulous, rather coriaceous, with 5 broadly-ovate obtuse ciliate spreading segments. *Petals* 5, imbricate, longer than the calyx, glabrous, broadly ovate, acute. *Stamens* 5, shorter than the petals. *Disc* fleshy, convex, dark-coloured, with a tuft of hairs in the middle; *ovary* in the male flower absent. *Drupe* obliquely obovoid, compressed, glabrous, about ·5 in. long and ·65 in. broad; the enlarged peduncle obconic, ·35 in. long, glabrous. *S. heterophyllus*, Hook. fil. (not of Blume) Hook. fil. Fl. Br. Ind. II, 35.

Barren and Little Cocos Islands; Prain. Andamans: Prain, King's Collectors. Perak: King's Collector, No. 7442 Andamans: Helfer, No. 1131.

There is a large suite of specimens of this species in the Calcutta Herbarium (twelve gatherings from the Andamans alone). I have dissected flowers of every one of these which is in flower, and I find that they all agree perfectly with each other. They also agree absolutely with Helfer's specimen, No. 1131. With the plant collected in Perak by the Bot. Garden Collector (No. 7442) they also as to flowers and leaves (fruit is absent) agree, except that the Perak plant has slightly larger flowers and that the calyx-lobes are longer and more acute. Helfer's specimen above quoted has, however, been referred by Dr. Engler, in his excellent monograph of the family of *Anacardiaceæ*, to *Semecarpus albescens*, Kurz. To that identification I must, with all respect, demur. Moreover an examination of the large suite of specimens of *S. albescens* in the Calcutta Herbarium proves that that plant is not a *Semecarpus*, but a *Holigarna;* for it has quite the fruits and spurred petioles of the latter genus. Its name ought therefore to be changed to *Holigarna Kurzii;* the specific name *albescens* being too like *albicans* which has already been applied to another species. Kurz was rather unfortunate in his treatment of this family. His *Holigarna Grahami* was not, as he supposed, the *Semecarpus Grahami* of W. and A., which is a plant confined to the West of British India and which does not extend to Burma. For the Burmese specimens included by Kurz under *H. Grahami*, Sir Joseph Hooker has substituted the name *H. albicans*, (Fl. Br. Ind. II, 38.) My own opinion, however, is that these Burmese plants are nothing more or less than *H longifolia* of Roxburgh, of which species that author has left an admirable coloured figure in the Calcutta Herbarium.

Besides the foregoing there are, in the Calcutta Herbarium, specimens from Perak (King's Collector, No. 6623) of a species of *Semecarpus* which, except in the finer reticulation of the leaves, agree excellently with Beccari's Bornean specimens, No. 2875, and 3318, which have been named *S. glauca* by Dr. Engler. (DC. Mon. Phan. IV, 478).

16. Drimycarpus, Hook. f.

Trees. *Leaves* alternate, petioled, simple, quite entire. *Racemes* or panicles axillary. *Flowers* small, subglobose, polygamous. *Calyx* superior; *lobes* 5, rounded, imbricate. *Petals* 5, erect, sub-orbicular, imbricate. *Disc* broad, annular. *Stamens* 5, inserted at the base of the disc. *Ovary* in the male flowers 0, in the female inferior, 1-celled; *style* 1, very short; *stigma* capitate; *ovule* attached to the wall of the cell. *Drupe* transversely obliquely ovoid, fibrous, flesh resinous; stone coriaceous. *Seed* attached to the wall of the cell, testa membranous; embryo thick, cotyledons plano-convex; radicle minute, opposite the hilum; plumule hairy. A single species.

Drimycarpus racemosus, Hook. fil. in Benth. and Hook. fil. Gen. Plantar. I, 424. A large tree: young branches rather slender, somewhat glaucous, the bark afterwards pale and striate. *Leaves* coriaceous, oblanceolate or oblong-lanceolate, shortly acuminate, the edges conspicuously undulate, the base cuneate; upper surface glabrous, shining, the lower dull often glaucous or glaucescent, the reticulations distinct in both; main nerves 14 to 18 pairs, spreading, often irregular, prominent beneath: length 4 to 6 in., breadth 1·2 to 2·25 in.; petiole ·35 to ·5 in., channelled. *Flowers* in racemes or panicles, terminal or in the uppermost axils, shorter than the leaves, puberulous, slender, the panicles branched from the base; male flowers sessile, fasciculate, the females shortly pedicelled, both about ·1 in. in diam. *Anthers* shortly ovate, *filaments* thick. *Disc* crenate, fleshy. *Drupe* broader than long, red when ripe, 1 in. or more broad, and about ·75 in. long. Hook. fil. Fl. Br. Ind. I, 36; Kurz For. Flora Burma I, 314; Engler in DC. Mon. Phan. IV, 472. *Holigarna racemosa*, Roxb. Fl. Ind. II, 82; Wall. Cat. 1006.

The Andaman Islands.—Distrib. Burma, the Assam Range, and the lower slopes of the Eastern Himalaya.

17. Dracontomelum, Blume.

Trees. *Leaves* alternate, unequally-pinnate; *leaflets* opposite or alternate, quite entire. *Panicles* axillary and sub-terminal. *Flowers* hermaphrodite. *Sepals* 5, imbricate. *Petals* 5, sub-erect, sub-valvate. *Disc* large, cup-shaped, crenulate. *Stamens* 10, inserted at the base of the disc. *Ovary* sessile, 5-celled; *styles* 5, thick, erect, connate by their obtuse stigmatiferous tips; *ovules* solitary and pendulous in the cells. *Drupe* globose, fleshy, tubercled above the middle by the style-bases; *stone* hard, depressed, 2–5-celled; *cells* diverging, opening by canals through the top of the stone. *Seeds* compressed, pendulous, testa membranous; *cotyledons* plano-convex; radicle short, superior, centrifugal.—Distrib. 5 species; natives of tropical Asia and the Pacific.

Dracontomelum mangiferum, Blume Mus. Bot. Lugd. Bat. I, 231, fig. 42. A tree 80 to 100 feet high; young branches stout, densely covered with minute deciduous tawny-tomentum. *Leaves* 12 to 20 in. long, their rachises minutely puberulous or glabrous, the petiole slender and but little thickened at the base; *leaflets* 5 to 8 pairs, alternate, rarely sub-opposite, thinly coriaceous, the upper ones elliptic-oblong, the lower ovate-oblong and shorter, all shortly and abruptly acuminate, unequal-sided with rounded oblique bases: both surfaces minutely reticulate when dry, the upper quite glabrous, the lower also glabrous but the midrib often puberulous and with small tufts of hair in the nerve

axils: main nerves 9 to 12 pairs, spreading, curving, rather prominent beneath; length 4 to 9 in., breadth 1·75 to 2·75 in.; petiolules ·15 to ·2 in. *Panicles* nearly as long as the leaves, from above the axils of the upper leaves or sub-terminal; the branches minutely tawny-pubescent, spreading, only about 4 to 15 in. long, the ultimate branchlets few-flowered, minutely bracteolate. *Flowers* ·3 in. long. *Sepals* united at the very base, a little shorter than the petals, elliptic, obtuse, minutely pubescent outside, pale. *Petals* oblong-lanceolate or spathulate, their apices recurved or linear, narrower than the sepals, inserted on the edge of the disc. *Stamens* about as long as the petals; the *anthers* narrowly oblong, cordate at the base, the filaments subulate. *Disc* broad, obsoletely crenulate. *Ovary* oblong-ovoid, deeply divided vertically into five 1-celled 1-ovuled lobes: *styles* long, slender, connate by their apices, stigma 5-lobed. *Drupe* depressed-globose, an inch or more in diam., mesocarp copious; the stone much depressed, very rugulose, crustaceous and with marginal pores. Hook. fil. Fl. Br. Ind. II, 43; Kurz For. Flora Burma, I, 322; Engler in DC. Mon. Phan. IV, 252.

In all the Provinces: a common tree.

Addition to Chailletiaceæ.

Since writing out this Natural Order for the last number of these papers, I have received two new species of the genus *Chailletia* of which I now give descriptions. And, in order to fit these into the key to the species given at p. 91 of the last volume of this *Journal*, I here reproduce that key, with these two new species introduced into their proper places and indicated by the letter *a* following the number of each.

Leaves oblong or elliptic-lanceolate.

Leaves very thin, quite glabrous; cymes globular, ·25 to ·4 in. in diam.	1.	*C. tenuifolia.*
Leaves coriaceous, glabrous except the midrib, strigose at the base; cymes 1 to 2 in. in diam....	2.	*C. Hookeri.*
Leaves membranous, with many fulvous bristles on the edges midribs and nerves ...	3.	*C. Griffithii.*

Leaves elliptic or oblong-elliptic.

Leaves coriaceous, upper surface with scattered bristles having bulbous bases, lower surface hispid especially on the midrib and nerves	3a.	*C. setosa.*
Midribs of leaves strigose beneath; cymes ·5 in. in diam.: ripe drupes ·65 in. broad...	4.	*C. Helferiana.*
Midribs of leaves quite glabrous, cymes ·3 in. in diam.; ripe drupes 1·25 in. in diam.	5.	*C. Laurocerasus.*

Leaves everywhere quite glabrous, their under surfaces tesselate-areolar ...	5*a*.	*C. tesselata.*
Leaves elliptic but more or less oblanceolate or obovate, glabrous	6.	*C. andamanica.*
Leaves elliptic-obovate, retuse, minutely tomentose on the lower surface	7.	*C. deflexifolia* var. *tomentosa.*

3*a*. Chailletia setosa, King, n. sp. A slender creeper; young branches and under surfaces of leaves with long yellow bristly hairs. *Leaves* coriaceous, elliptic-oblong, acuminate, the base narrowed to the very short petiole; upper surface shining, with scattered bulbous-based bristles most numerous on the midrib near its base; lower surface of a yellowish-olivaceous colour, much reticulate; main nerves 9 or 10 pairs, curving upwards, very prominent and bristly on the lower surface, less so on the upper; length 6 to 8·5 in., breadth 2 to 3·25 in.; petiole ·15 in. long, densely hispid. *Cymes* axillary, very short, often in pairs, 4- to 6-flowered, almost sessile. *Flowers* ·2 in. long. *Sepals* oblong, blunt, very concave, much imbricate, densely pale-tomentose outside, glabrescent inside. *Petals* shorter than sepals, oblong-obovate, the apex with 2 rounded concave lobes, quite glabrous. *Stamens* as long as the petals, glabrous; the *anthers* adnate; the connective broad and bearing the narrow cells on its margin. *Ovary* densely lanate. *Fruit* unknown.

Perak: King's Collector, No. 10429.

A species closely allied to *C. Griffithii*, Hook. fil.; but with larger leaves of thicker texture and very much more hispid.

5*a*. Chailletia tesselata, King, n. sp. A slender woody climber, 10 to 15 feet long: young branches glabrous, shining, the bark black when dry. *Leaves* coriaceous, more or less broadly elliptic or elliptic-oblong with a short sub-acute often abrupt apical point; narrowed in the lower fourth to the petiole, the edge slightly recurved: both surfaces quite glabrous, the upper shining with numerous very minute black dots, the lower tesselate-reticulate: main nerves 6 or 7 pairs, spreading, much curved upwards and forming wide arches far from the edge, prominent on the lower surface; length 4·5 to 5 in., breadth 2·5 to 3 in.; petiole ·4 in. long, rough when dry and with transverse ridges, puberulous. *Cymes* axillary, in pairs, shortly pedunculate, much-branched, many-flowered, minutely yellowish-tomentose, from ·5 to 1 in. in diam. *Sepals* oblong, obtuse, tomentose on the outer surface, glabrous on the inner. *Petals* glabrous, obovate, sub-acute, deeply bifid at the apex, the lobes oblanceolate. *Stamens* longer than the petals, exserted, glabrous, the broad orbicular connective bearing the narrow anther-cell on its edge; the *filaments* thick. *Ovary* ovoid, covered with white wool. *Style* longer than the ovary, *stigma* bifid. *Fruit* unknown.

Trang: Wray, No. 3185. Perak: King's Collector, No. 6726.

A species of which the nearest ally is *C. Hookeri*, King, which has however much narrower leaves not tesselate on the lower surface. This is also allied to the Bornean species *C. Beccariana*, Stapf, which has however much smaller leaves, not tesselate beneath.

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